

Tempus UAS Technical Assistance Request

Tempus UAS power management system characterizes Photo Voltaic, Battery and attached machine usage for high performance applications. The advanced solar charging system is optimized and utilizes our patent pending dynamically computed machine health and failure prognostics algorithms. This process characterizes PV input and attached battery and machine load performance and creates a power utilization profile which allows for real time performance evaluation and preventative maintenance alerts for motors, servos, and other attached equipment.

The Tempus UAS project has several areas of need that the American Made Network and/or a National Labs can assist with which we have outlined below:

1: **Power and charging system** testing. We are working in high performance applications where every possible effort will be made to improve efficiency over a wide variety of PV battery charging and run time device load characteristics. It will be helpful to have test and performance data to evaluate performance of the system across specific illumination scenarios, battery state of charge, and dynamic load values.

2: **Testing and certifications** and an initial standard that we want to work towards is MIL-STD-108. This requires us to look at potential water and dirt ingress. Expertise in testing, certifications, ruggedization and enclosure design are key factors in a decision to work with a testing partner.

3: **Prognostics**. For any attached motorized devices and servo mechanisms, for example, device health may be characterized and used to make predictions about motor health that allow for predictive maintenance to be performed. Systems are in use that detect incipient failure of brushes on DC motors that allow an equipment operator to schedule service **before** the motor fails in the field. Expertise in characterization of device failure modes will allow us to create operational profiles that can be used to help predict motor failure.

4: **Market Research and Customer Requirements**. Partnering with an American Made Network affiliate would be important to research customer requirements for marine, commercial, Naval, and Coast Guard use cases including budgetary, purchasing, any specific regulatory requirements, and other issues related to sales and marketing for the system. Identifying business rules and use cases that are important to potential customers will permit the creation of a business development plan to allow efficient resource allocation and prioritization of development efforts.