

Lightning Talk 1: Requirements and Standards

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Project Summary

Our project is to develop a solar cell and battery to be used to power and charge an electronic derailleur (device used to shift gears on a bike). Our client, Dr. Raman, has given us a specific model of derailleur to make this battery compatible with, as well as a set of tolerances concerning size, function, and resilience of the final assembly.

Requirements

- Total size of battery and solar panel to be within 2x2.5x1 inches
- Final assembly must be IP58 water, dust and vibration resistant
- Battery must fully charge in 6 hours of direct sunlight
- Battery must be of sufficient size to run for 10 hours in dark or low light
- A charge control circuit will be included in the product
- The product must be plug and play with the Sram Rival eTap AXS Rear derailleur

Applicable Engineering Standards

- IEEE 1562-2021: Practices for sizing PhotoVoltaic systems
 - Provides information to assist in sizing the array and battery of a stand-alone photovoltaic system
- IEC 60529, IP58
 - Protected from limited dust ingress and long term immersion in water under pressure for long periods