Product Description - Power, Backplane & Controls System for RoboSub

1. Team Name
   1. Ocean’s Seven
2. Team Members
   1. Kyle Harlow
   2. Larry Manalo
   3. Abby Caballero
   4. Yuvin Kokuhennadige
   5. Hassan Alahmed
   6. Daniel Henderson
   7. Cassandra Noice
3. What user problem is your product/device/system trying to solve?
   1. In previous years the RoboSub team has run into problems with wire management, high CPU usage and power delivery problems. Our team hopes to eliminate these problems with a concrete electrical system design.
4. What is the overall product solution?
   1. Backplane: PCB that will standardize and simplify data and power distribution.
   2. Power: Improved buck/boost converters to manage multiple voltage requirements and reduce power loss
   3. Control System: CPU independent controller to manage motor regulation and reduce CPU requirements
   4. Power, Backplane, and Controls System will eliminate most required wire management from the vehicle with the backplane. Concrete modular power design will allow for more efficient power delivery. By relocating the controls management off of the main CPU the project can reduce overall CPU usage.
5. Who needs this? Who will benefit from this?
   1. RoboSub will benefit by having a more heavily integrated electrical system which includes a high degree of modularity. In addition, in an ideal situation the system we design could be easily adapted to commercial autonomous underwater vehicles (AUV’s) uses.
6. What capabilities does your product/device proved that are not commonly available
   1. Our system will have a high degree of integration. Instead of having to individually install separate wires and products the design will have individual modular boards.
   2. Our system will provide power delivery without significant reliance on wires.
   3. Our system will provide low-latency controls for efficient movement of the vehicle.
7. What are the top project risks you perceive at this time?
   1. Only one team member has significant experience with AUV system design.
   2. Our product relies heavily on integrating various sensors from different companies and different data-types/formats into a single system.
   3. High current design has potential to impact varying components/data/etc.