

BACKGROUND

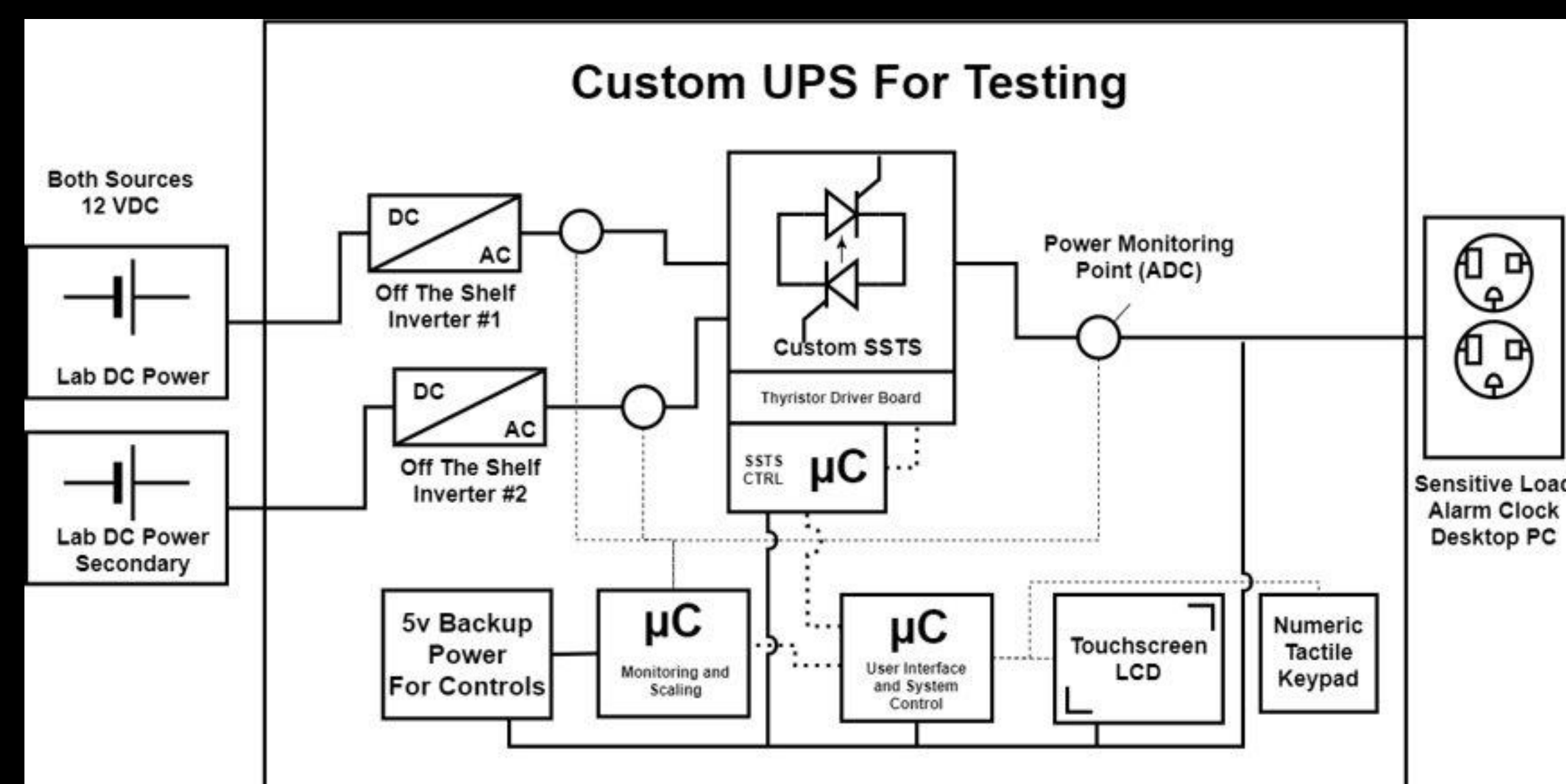
The Bayview Navy has an unmanned electric submarine (LSV2) gathering acoustics data at Lake Pend Oreille. Onboard, it is vital the Guidance Navigation Controller remains always powered on. A long enough interruption would lead to a costly recovery effort.



VALIDATION AND REQUIREMENTS

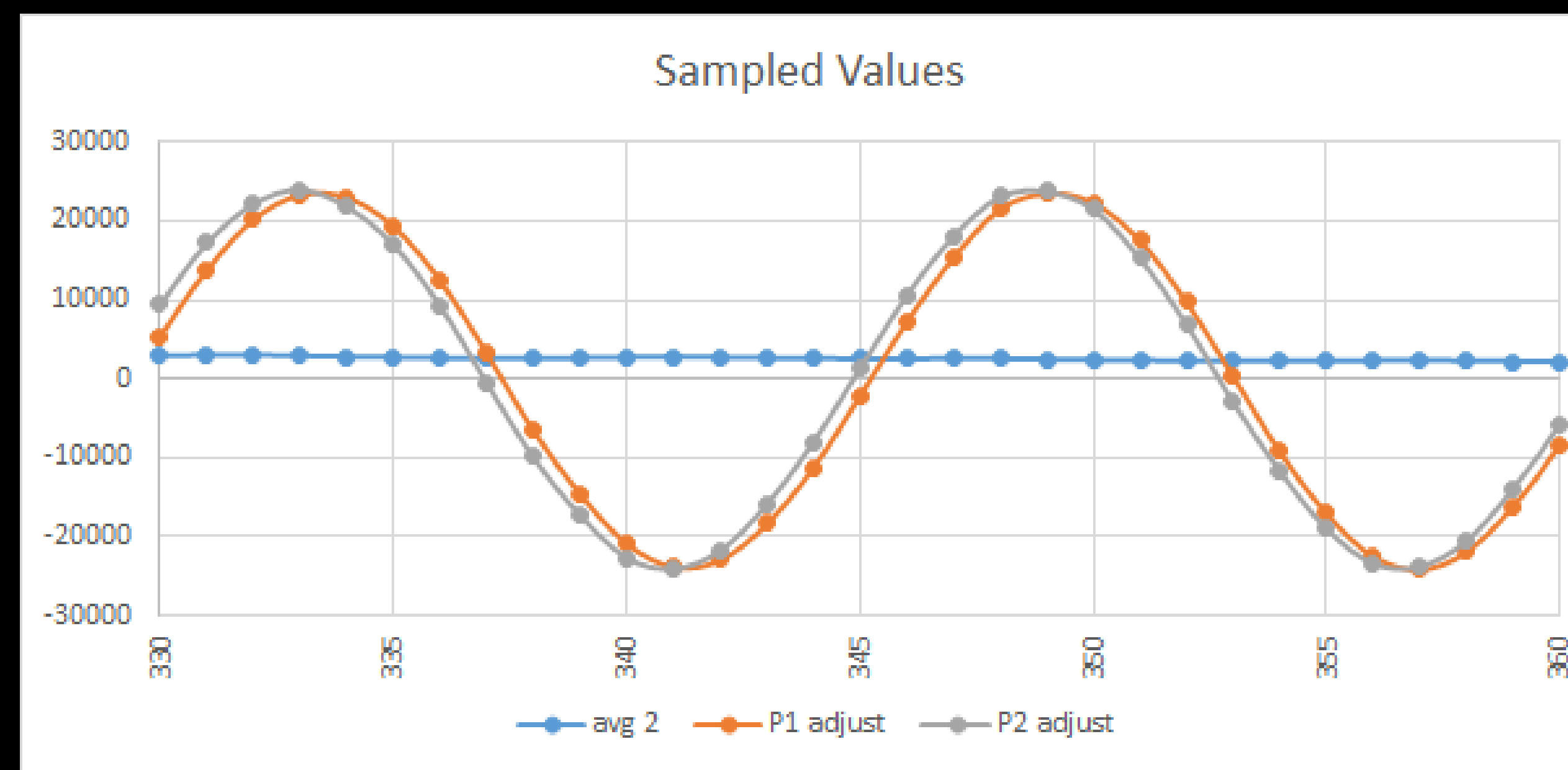
Our task was to design and build a modern, robust prototype inverter-UPS that can monitor and respond to power events – one that's scalable to match Bayview's power specification. For example, if the primary DC source dies, the UPS should switch over to the secondary fast enough such that no connected devices malfunction.

In addition to the prototype, our team provided Bayview with a paper study outlining existing market solutions with quotes from manufacturers.

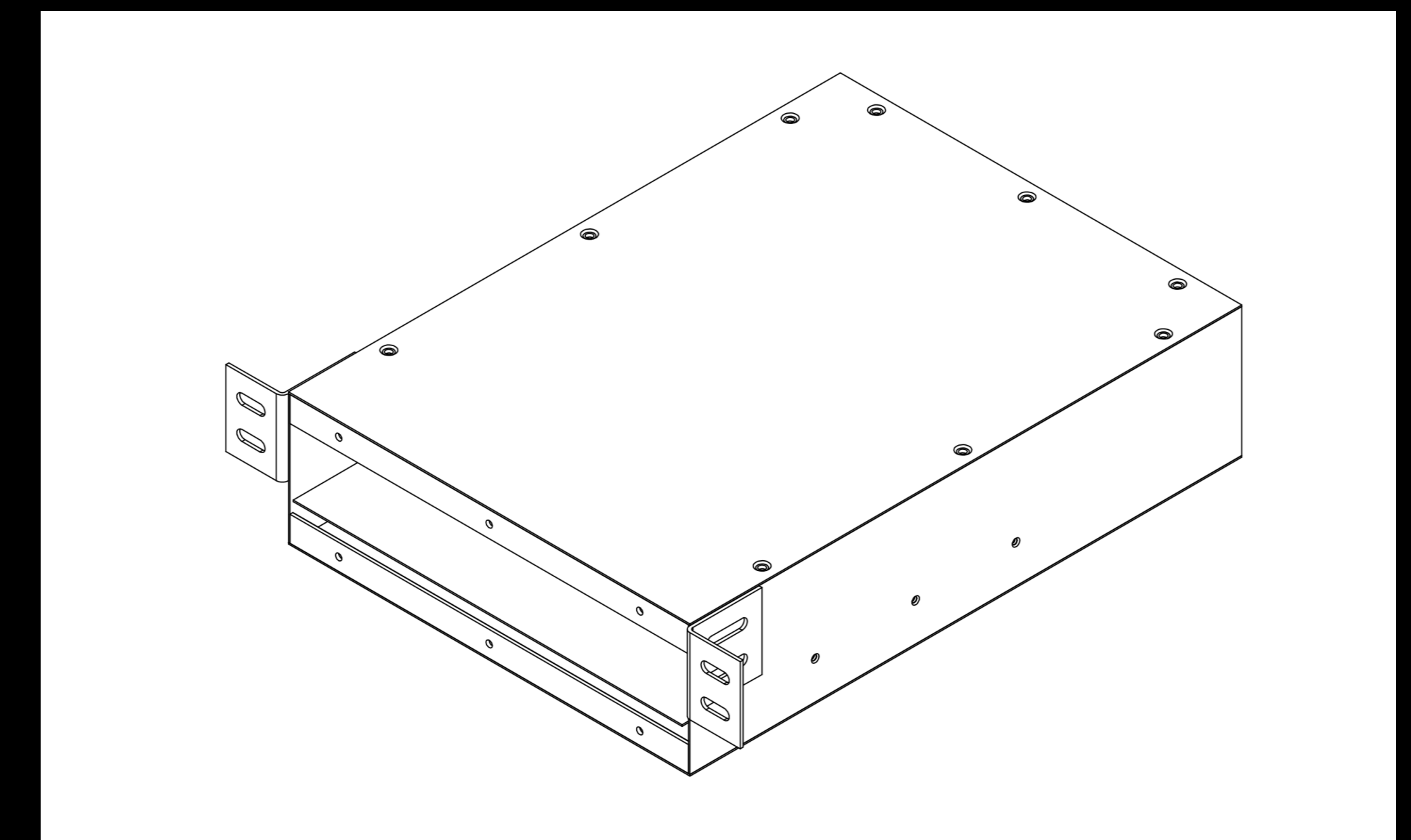


CONCEPT DESIGN FEATURES

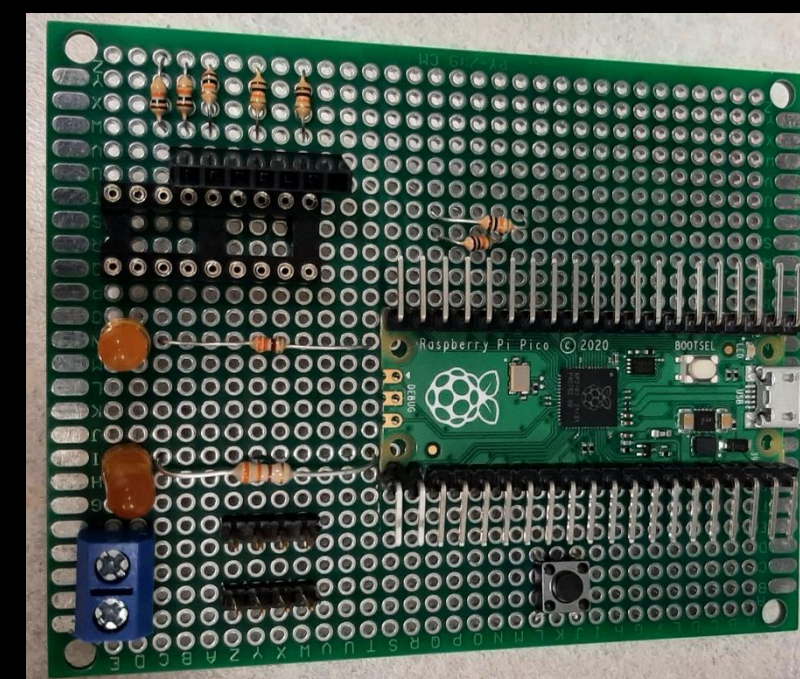
REALTIME DATA ACQUISITION AND ARCHIVAL



19" RACK MOUNT ENCLOSURE



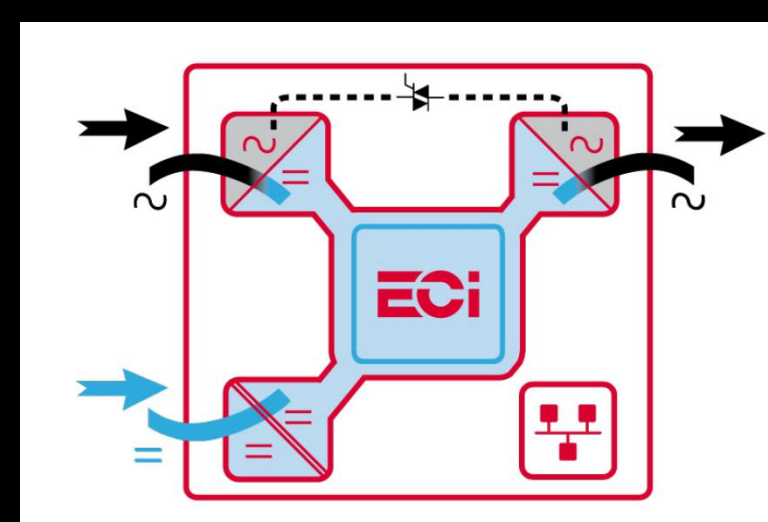
RASPBERRY PI PICO MICROCONTROLLERS



THYRISTOR SCR SWITCHES



PAPER STUDY



Quotes for compatible inverter systems procured from Helios (system figure on the left) and Excel Tech.

Our Team:



Left to right) Zach Furrow [ME], Chris Fuentes [ME], Kyle McCain [EE], Dale Parkinson [EE], Austin Gress [EE]

RECOMMENDATIONS

There is much more potential that could be extracted from this device without changing much of the hardware. This may include configurable settings menus, better SCR pulse triggering and faster data acquisition. Significant room for improvement lies in software optimization.

This project has also exposed a market vacancy for low cost, phase adjustable AC to DC power inverters that can synchronize with one another.

Acknowledgements & Thanks:

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