Design of Next Generation Ultrasonic Meter for Siemens Industry

Overview
Siemens has identified a demand for a portable version of their premier SITRANS FST030 Ultrasonic Flow Meter. The Siemens SITRANS FST030 transmitter currently utilizes a wall-mount housing made out of aluminium layered with corrosion-resistant coating, making it bulkier and not suitable for adequately protecting its electronic components from harsh environments. This project aims to design a highly manufacturable enclosure that is rugged, weatherproof, and has robust connectors allowing the device to function in ambient temperatures of -18°C to 60°C for 48 to 72 hours while meeting the IP67 enclosure rating.

Objectives
The objectives of this project is to design a suitable enclosure for the new flowmeter, such that:
1. It is still considered portable in dimensions compared to the older device
2. It consists of mineral reinforced polypropylene or a similar material
3. It meets the IP67 enclosure rating, is rugged, and is weatherproof
4. It is highly manufacturable
5. It has a sufficient battery power supply

Approach
- Identified desired specifications of the portable enclosure through sponsor meetings
- Researched components for design selection of the material, case, ports, and battery
- Generated initial design selection reports with regards to specifications, manufacturability, and cost
- Created 3D CAD models of the case geometries in SolidWorks to select an optimal enclosure
- Analysed power draw of components to determine battery specifications
- Purchased two promising cases to test the fit of the internal components
- Performed cost analysis to determine the cost of the product and project

Outcomes
- The recommended design will cost Siemens $2216.12.
- Manufacturability is preserved due to minimal changes in critical components
- Siemens will receive a recommended design that meets the rugged, weatherproof, portable, and IP67 specifications