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# Reengineering of PCB and Enclosure for Advanced Leak Detection System

#### **The Client**

This case study is for a client in the European Glass Manufacturing company. Motherson Technology Services was approached by a leading manufacturer of industrial equipment seeking a more reliable and efficient method for leak detection. The client envisioned a solution utilising advanced lead sensor technology for precise and timely leak identification.

#### Overview

This project focused on reengineering an existing PCB design and its enclosure to enhance leak detection functionality. The key objectives were:

- Modify the existing design to accommodate a separate PCB board dedicated to leak detection
- Achieve complete isolation of the main board from potential leak impacts
- Design a new mechanical enclosure to house the leak detection system in a segregated compartment
- Conduct comprehensive functional testing, validation, and prepare the design for production



Engagement CAD Design, Reverse Engineering



Tools

Allegro PCB Design Oscilloscope SolidWorks

### Expertise

The project leveraged expertise in various areas, including:



Hardware design



Embedded systems





PCB design and layout



Leak detection sensor integration

#### **The Solution**

The solution tackled leak detection with a multi-step approach. First, separate PCB boards were designed: one for main functionality and another dedicated solely to leak detection. This separation ensured leaks wouldn't impact the main system. Allegro PCB Designer optimized board layouts for efficient operation and isolation. Finally, SolidWorks created a new enclosure with a segregated compartment for the leak detection board, further enhancing isolation and ease of maintenance. Rigorous testing validated performance and prepared the design for production. This reengineering resulted in a robust and isolated leak detection system.

#### **Business Value Delivered**

The reengineered leak detection system delivers several wins. The isolated design minimises leaks affecting the main system, leading to more accurate leak detection. This isolation also safeguards core functionality, even during leaks, improving overall system reliability and reducing downtime. Simplified maintenance due to the segregated compartment further enhances efficiency, and early leak detection can potentially save costs by preventing damage to the main system.