Water Level Detector Proof of Concept (PoC)

Submitted to Aliaxis

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Abstract

This project, commissioned by Aliaxis, involves an analogue system designed to detect water level in a water tank. The system consists of a vertical probe, a transmitter and a receiver. The transmitter transmits a signal to the receiver using red light. The report comprehensively elaborates the water level probe and the designs of both the transmitter and the receiver. This report also outlines the evaluation of the prototype, its range, stability, and accuracy.

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Introduction

Client requirements

Our client, Aliaxis, has asked for a few requirements for the design of the project. This involves accuracy, compliance, system stability, transmission (Tx) range and battery life.

Accuracy – An analysis should be conducted to determine the accuracy needed by the system sensor converting water level values into electronic measurements

Compliance – The device must transmit data without radio frequency (RF) emissions to avoid the system needing to meet and be tested

Design tools and methodology

In this project, our team used software for designing and simulating. FEMM was used to simulate the dielectric material of the water level probe, we compared the accuracy of the probe using 2 different materials. In addition of using software for design tools, we used LTSpice to simulate the circuit for the transmitter and receiver of the project, with

1. Water Level Probe
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      We were given 2 options for the dielectric material of the probe, silicone rubber and polyvinyl chloride (PVC). After using the
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