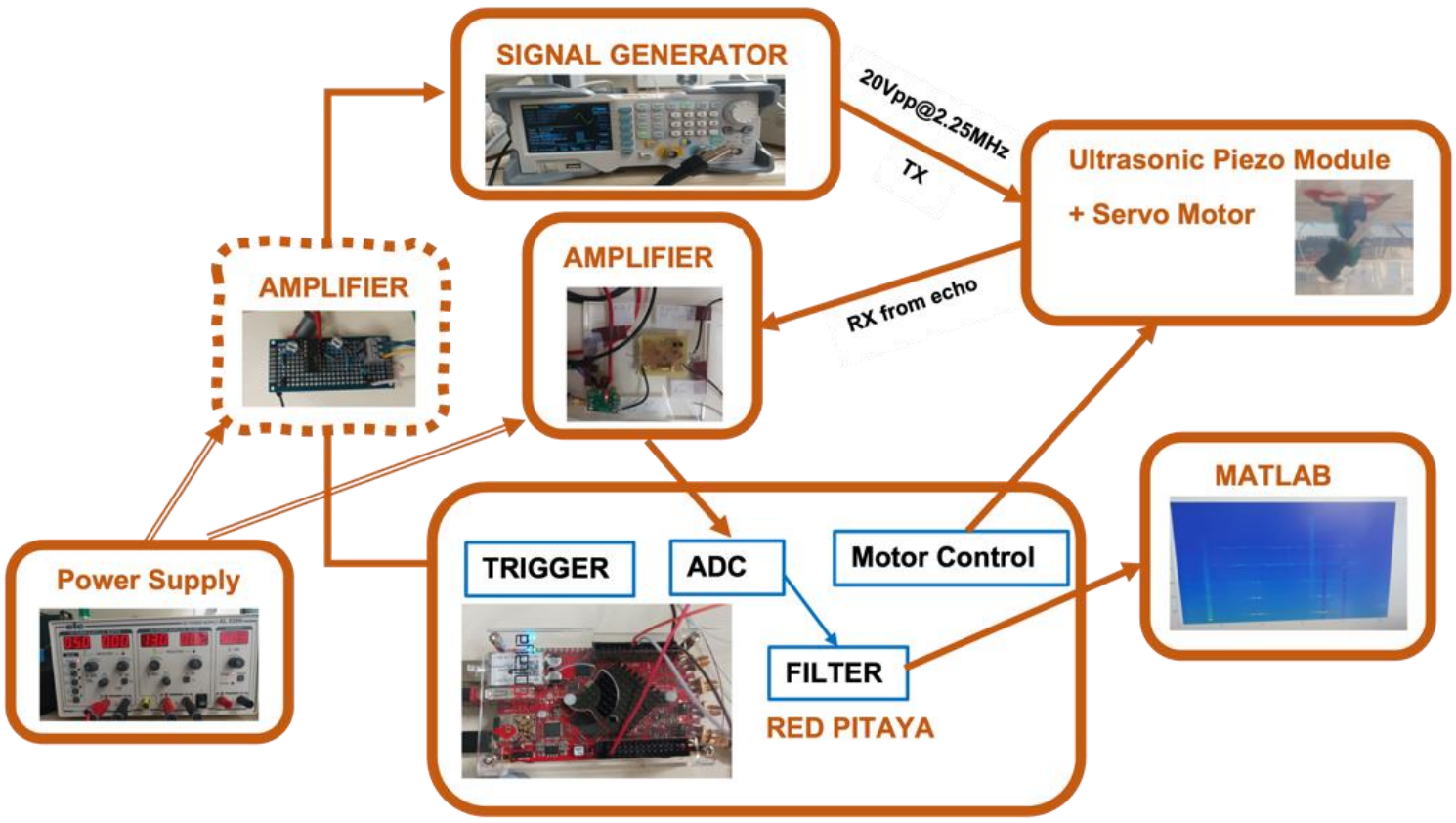
Under water ultrasonic detector

ABSTRACT: This project delves into a pulse-echo methodology for measuring distances in water using ultrasonic technology. The process involves leveraging Red Pitaya to initiate a signal generator, which then generates signals that are directed into a piezoelectric ultrasonic transducer. After passing through an amplifier circuit, the transducer receives the echo signal. The digitized signals are subsequently processed and analyzed using MATLAB, enabling the calculation of the time of flight, which is then plotted in a figure. Prior to analysis, certain essential filtering operations are performed in an embedded Linux environment.



CHALLENGES:

1. Pulser board not available.
2. Red Pitaya's output trigger level too low.

SOLUTIONS:

1. Use wave signal generator with external trigger to synchronize with acquisition.
2. Use OPAMP circuit to amplify trigger signal from 1 V to 5 V.