WESTERN MICHIGAN UNIVERSITY

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

ECE-4820 SENIOR DESIGN II

Claims-Investigation Committee (CIC) Multi-Input Testing Device

FINAL REPORT (OUTLINE/DRAFT)

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Contents

1 Abstract

- Summarize project need
  - Ease of testing devices
  - Technicians and engineers benefit
- Summarize project architecture
  - Custom PCB for device interfacing
  - Using ARM Cortex-M4 for testing devices
  - Embedded Linux running on ARM Cortex-A7
  - Rust written Server to communicate to web-application and Cortex-M4 firmware
  - Web application using WebAssembly for simple user interaction that provides a CSV
- Summarize results
  - Measurements by X firmware had x% accuracy
  - Total costs are X

2 Introduction

Describe Purpose and Scope of project

- Project aims to simplify testing proceedures at ZF
- Utilize industry technology such as ARM processors and microcontrollers as well as Yocto Project for embedded Linux
- Use emerging technologies to solve real world problems (Rust programming language and web assembly)
- Goal to have a functioning project.

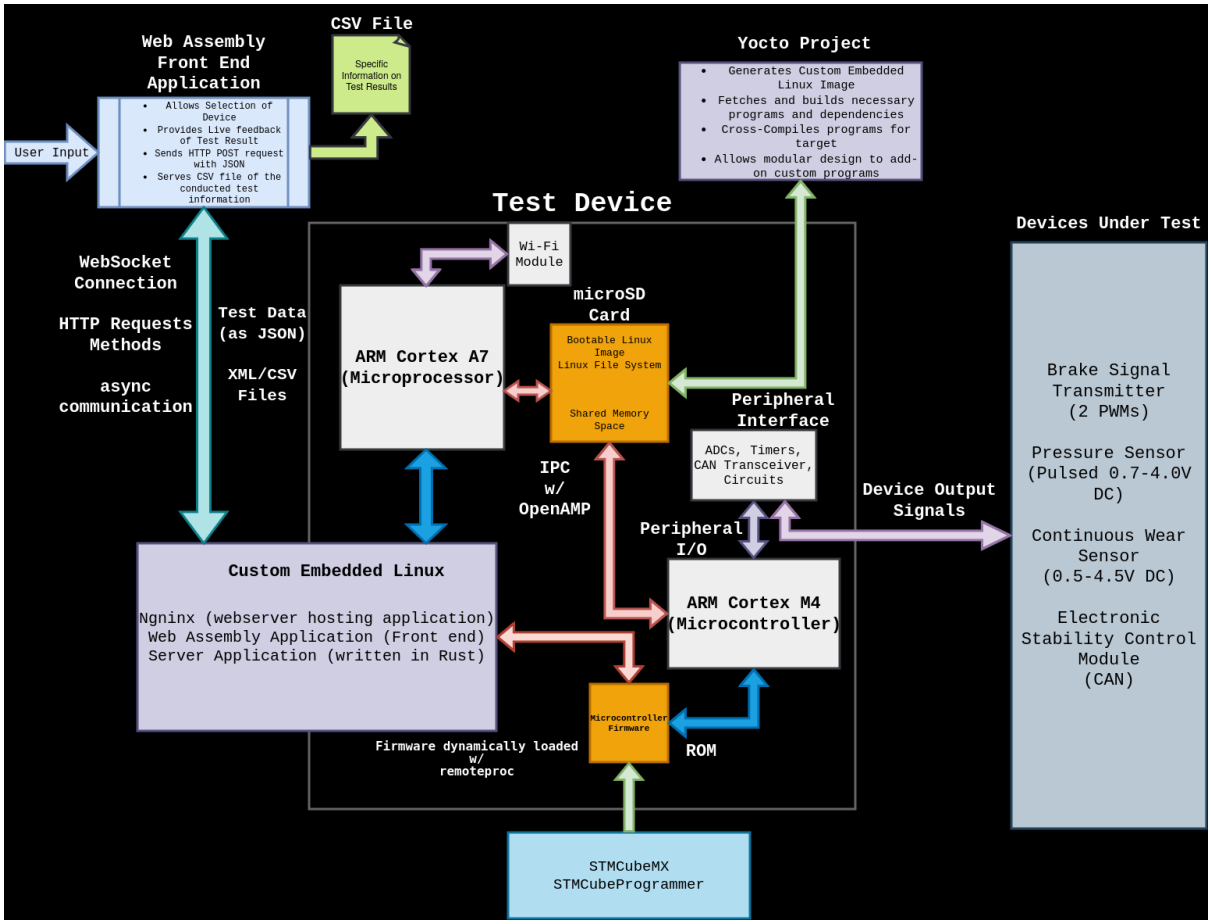
3 Discussion

3.1 Background

3.2 Need Statement

- Describe current Device testing situation at ZF
- explain why it is suboptimal and current difficulties
- Explain who is affected (the engineers and technicians times')

3.3 High-Level System Design



3.4 Specifications

- list PCB circuit specifics here as well as DUT specifications
- Heterogenous architecture with Cortex-A7 and Cortex-M4 processors
- Embedded Linux built with Yocto Project build system
- Custom Server API written in Rust
- Web Assembly application to interact with Server and microcontroller

3.5 Deliverables

- Custom PCB schematic diagram with layout
- Verification of M4 firmware measuring correct values
- Project Gantt Chart estimated actual

4 Design and Implementation

4.0.1 Custom Printed Circuit Board for Device interfacing and Power Management

4.1 Arm Cortex-M4 firmware for device Testing

4.2 Embedded Linux with Yocto Project

4.3 Custom API Web Server in Rust

4.4 Web Assembly Application using the Yew framework

4.5 Design Considerations

4.5.1 Public Health

4.5.2 Safety and Welfare

4.5.3 Global Impact

4.5.4 Cultural Impact

4.5.5 Social Impact

4.5.6 Environmental/Sustainability

4.5.7 Economic

4.6 Design Impacts

4.6.1 Global

4.6.2 Economic

4.6.3 Environmental

4.6.4 Societal

4.7 Performance and Testing Analysis

5 Conclusion