ECE 411 Homework 7 - Test Plan

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Revision V1.0

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TEST PLAN

Electro-Mechanical Automatic Relief System

1.0 Introduction

1.1 This document

2.0 Reference Documentation

3.0 Test Equipment

- Laboratory DC Power Supply (GWINSTEK GPS-3303)
- MSO 4054 Mixed Signal Oscilloscope
- Personal Computer
- Linker (ST Link V2)
- DMM 4020 5 ½ Digital Multimeter
- Pressure Chamber

4.0 System Tests

5.1 Unit Tests

5.1.1 MCU Power Supply Test

5.1.2 DC-DC Regulator Test

5.1.3 Solenoid Test

5.2 Integration Tests

5.2.1 MCU Power Supply Test with DC-DC regulator

5.2.2 MCU Power Supply & MCU ChipTest

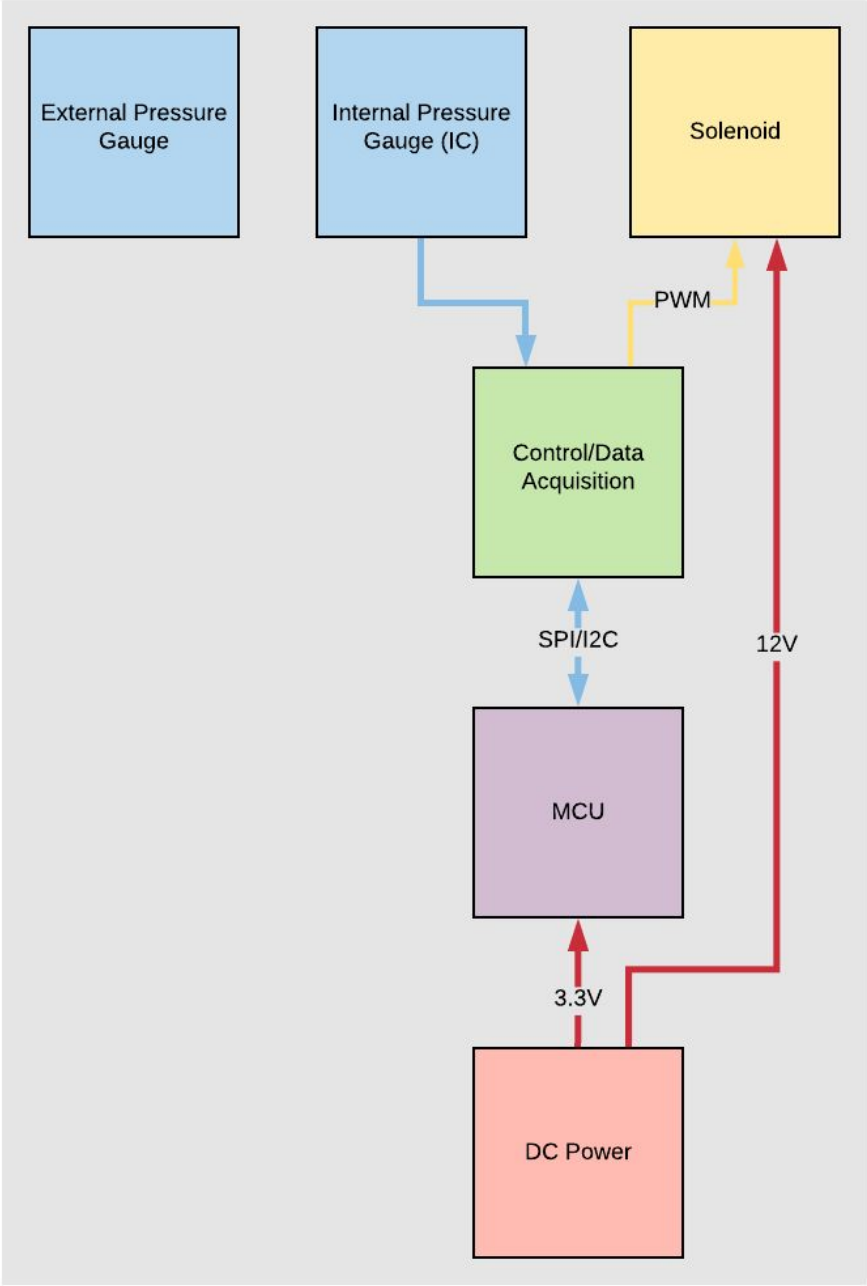
5.2.3 Solenoid & MCU Power Supply & MCU Chip Test

5.3 Acceptance Tests

5.3.1 Pressure Relief Valve Test (System is working altogether)

1.0 Introduction

EARS, also known as Electro-Mechanical Automatic Relief System is a system that will monitor the pressure of a fluid within a chamber and control a relief system to alleviate excess pressure. A general logic flow of the project goes as the following,



1.1 This document

The purpose of this document is to specify a test plan for the EARS device. It will outline the test cases and how they will be approached, and by whom. Testing this device in many different ways to ensure that it will work in different conditions and work very consistently.

2.0 Reference Documentation

Product Design Specification

Board Layout and Board Schematic V1.1

Datasheets -

- **STM32L151x6/8/B-A**
- **ECX - 32 SMD Crystal**
- **ECX 34G SMD Crystal**
- **LM386 Datasheet**
- **LMR16006 Datasheet**

Detailed Tests:

5.1.1 MCU Power Supply Test

Test Writer: Austin Joseph, Wyatt Pausz, Jake Pratt, Juan Rivera-Mena						
Test Case Name:		**MCU Power Supply Test**		**Test ID#:**		
Description:		**Testing to see whether the power supply portion is functional.**		**Type:**		**Blackbox Testing**
Tester Information						
Name Of Tester		**Wyatt & Juan**		**Date:**		
Hardware Ver:		**1.1**		**Time:**		
Setup:		**Have a power supply built and ready to test.**				
Step	**Action**	**Expected Results**	**PASS**	**FAIL**	**N/A**	**Comments**
1	**Check the input voltage into the regulator**	**Input voltage should be within limitations**				
2	**Make sure the component traces are good**	**There should be no 'missed' connections**				
3	**Check the output voltage from the regulator**	**Output voltage should be within limitations**				
Overall Test Results:						

5.2.3 Solenoid & MCU Power Supply & MCU Chip Test

Test Writer: Austin Joseph, Wyatt Pausz, Jake Pratt, Juan Rivera-Mena						
Test Case Name:		**Solenoid & MCU Power Supply & MCU Chip Test**		**Test ID#:**		
Description:		**Putting everything together to test the functionality of our project.**		**Type:**		**Black Box Testing**
Tester Information						
Name Of Tester		**Wyatt & Jaun**		**Date:**		
Hardware Ver:		**1.1**		**Time:**		
Setup:		**Connect Power to MCU power supply, connect MCU power supply to MCU chip and the MCU chip to the solenoid.**				
Step	**Action**	**Expected Results**	**Pass**	**Fail**	**N/A**	**Comments**
1	**Turn on Power to MCU power supply**	**See the chip start/light up**				
2	**Start to build pressure in the solenoid**	**See the pressure gage attached to the solenoid starts to rise**				
3	**Relief of pressure in the solenoid after given pressure is exceeded**	**Hear the relief of pressure leaving the solenoid**				
Overall Test Results:						