POA Internship

**Technical Considerations internship assignment Health Concept Lab**

**Student:** Casper R. Tak

**Studentnumber:** 657313

**Client**: Rudie van den Heuvel

**Coach:** Jeroen Veen

**High School:** HAN Arnhem

**Education:** Embedded Systems Engineering

**Date:** 25-08-2022

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Technical Considerations** | | |  |  |
| **Part** | **(Expected) Function** | **Pros** | **Cons** | **Notes** |
| **Raspberry Pi 4** | **Main computer** | **All in one computer, good documentation, good software support.** | **Chip shortage creates vulnerability for supply chain** | **The compute model 4 is not an easy alternative since there is no build in camera connector. The Raspberry Pi 4 model B seems the most suitable.** |
| **TPS61158** | **LED driver** | **Flexible digital and pwm brightness control, 100:1 pwm dimming ratio, soft start build in.** | **Datasheet unclear if there is a switching value of 750 Mhz or Khz** | **Mistakes in datasheet it seems, wrong frequency ratings.** |
| **TPS6106x** | **LED driver** | **Pwm brightness control, digital brightness control, 1mhz fixed switching frequency** | **Made for multiple leds it seems, only 80% efficient** | **led disconnect during shutdown** |
| **TMC2209** | **Stepper driver** | **High quality, good documentation** |  |  |
| **ST L297** | **Stepper driver** | **Reputable brand, low cpu usage** | **Expensive** |  |
| **Tmc2130** | **Stepper driver** |  |  |  |
| **Tmc2208** | **Stepper driver** |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Nr.** | **Functionality** | **1** | **2** | **3** | **4** | **5** | **6** | **Points** | **Weightfactor** |
| **1** | **Dim the led without visible flickering** | - | 1 | 1 | 1 | 1 | 1 | 5 | 5 |
| **2** | **Provide enough power to fully brighten LED** | 0 | - | 0 | 1 | 1 | 1 | 3 | 3 |
| **3** | **Enough brightness levels** | 0 | 1 | - | 1 | 1 | 0 | 3 | 3 |
| **4** | **PWM and digital control** | 0 | 0 | 0 | - | 0 | 1 | 1 | 1 |
| **5** | **PWM only control** | 0 | 0 | 0 | 1 | - | 1 | 2 | 2 |
| **6** | **Highest energy efficiency as possible** | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |