System Verification

EGR 314 Team 306 Verification Table (Hoge, Striffler, Turner, Ventura)

	3.3V Regulator	Micro-controller PIC18F16Q41	Humidity Sensor	Temperature Sensor	Motor	Motor Driver	DAC (LED)	
3.3V Regulator	v (CT 4/21/23)	v (CT 4/21/23)	v (CT 4/21/23)	v (CT 4/21/23)	u	v (CT 4/21/23)	x	
Micro-controller PIC18F16Q41		v (CT 4/21/23)	u (i2c)	u (i2c)	nc	u (SPI)	u (DO)	
Humidity Sensor			u	nc	nc	nc	nc	
Temperature Sensor				u	nc	nc	nc	
Motor					nc	nc	nc	
Motor Driver					u	u	nc	
DAC (LED)						u	u	
0							nc	

Key

u	unverified connection/subsystem
x	connection verified by you
v (XYZ 1/23/45)	connection verified by instructors (INITIALS, date)
(xyz)	serial protocol
nc	No Connection

Lessons Learned

1. We learned a lot about vias and their limitations in overall PCB design.
2. We learned about many important parts of the design layout of the switching regulator and TI application parts.
3. We learned the importance of trying to keep things as simple as possible for both functionality and assembly of the PCB.
4. Cadence has many advantages and very specific disadvantages that we learned to facilitate more efficient work through the project.
5. We had to familiarize ourselves with the proper usage of flyback diodes when implementing them in our motor driver system.
6. Size matters on everything, the smaller the component the more trouble you're going to have, and going slightly larger on traces may be a saving grace.
7. We learned through failure how to properly avoid pcb manufacturing troubles within the actual tolerances, dimensions, and layout.
8. A large, yet simple thing we became aware of was the importance of distance to the ground and how that can affect the systems on a PCB.
9. We learned the importance of understanding the necessary components for I2C communication and how they will affect coding.
10. We had to develop our understanding of the Thonny interface and how to make it accept new code when working with the ESP32.

Future Recommendations

1. Try to mess with Cadence in one's free time early into the course in order to try and gain a better base comprehension for future use.
2. Take time and research footprints of surface mount parts early into the course to understand the issues that must be addressed in the final design.
3. Focus on trying to have everyone work together on each subsystem as multiple pairs of eyes save a lot of mistakes and revisions.
4. Note the physical dimensioning of everything from electronic parts to the board to the motor to make the final project outcome go together more seamlessly.
5. Read all feedback and actively change the submissions as feedback is received. It allows for more forward progress on the project.