



EBEC Challenge

European BEST Engineering Competition Challenge

Participating in Innovative Design with Aspöck



Team ECT-Sub23:

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A horizontal bar with a teal segment on the left and an orange segment on the right.

Introduction

Objectives: Create a system with multiple types of signaling and illumination.

- Direction indicator (Amber LED).
- Visual feedback on the cockpit (Green LED).
- Audio signal (Buzzer).
- Cornering lamps for side illumination when turning the steering wheel (White LED).

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Reached Guidelines

- Switch on the direction indicator when the actuation of a switch (1 Hz).
- Give an audio signal that gives feedback to driver on its well function when the turn indicator is activated.
- Give a visual signal that gives feedback to driver on it's well function synchronized with the audio (also 1 Hz).
- Switch on the cornering lamp when the steering wheel is rotated (according to the angle).

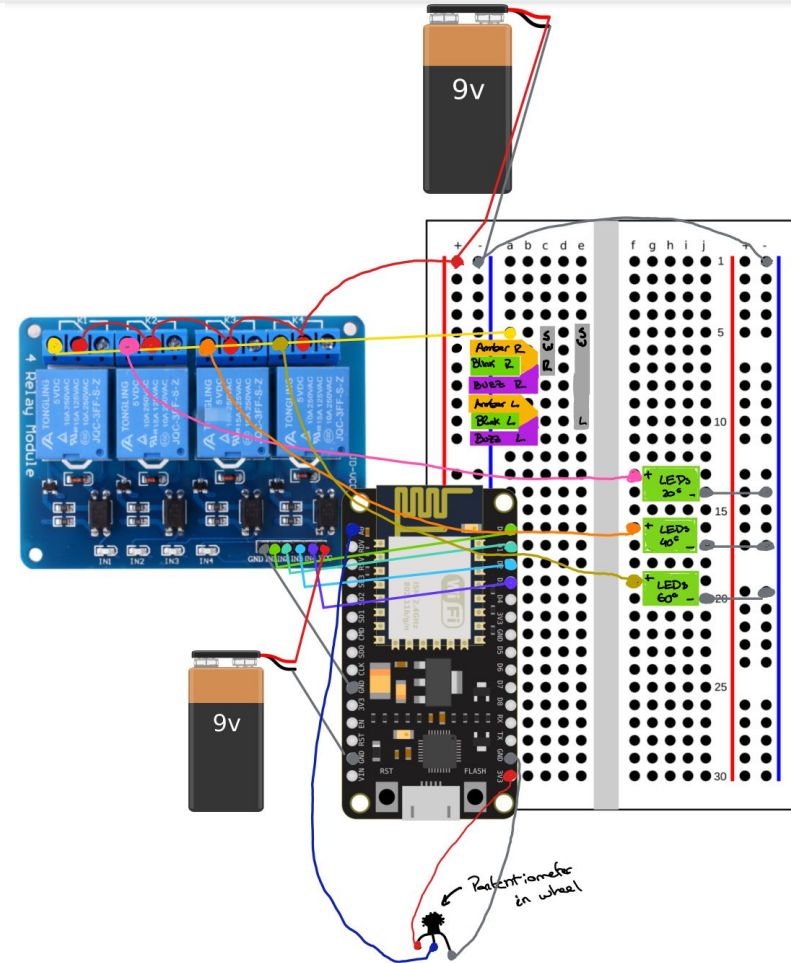
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Material Used

- The cockpit structure was constructed with wooden planks aside from some cosmetic options.
- We used the steering wheel available for its physical feedback and the potentiometer.
- An esp8266 is used to simulate a car ECU and get the steering wheel rotation angle.
- A 4-relay module was used to control the cornering lamps (this choice was done by personal preference).
- 2 two-state switches to choose the blinking side (or both).
- 1 steering wheel with a potentiometer.
- 9V batteries.

Solution

- To achieve our design we are using one ESP8266, a 4-Relay module, 9V batteries, 2 switches, 2 buzzers, 1 potentiometer (inside a steering wheel) and finally the LEDs requested.
- Each direction (divided by the switch) has a blinker indicators, amber LED and buzz that share the same signal.
- Each “state” of LEDs is controlled by the relay, one for the blinkers, one for the 20° cornering lamps, another for 40° and a last one for 60°.
- We get the angle of the steering wheel using a potentiometer.



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Additional features

- Three - gradual cornering lamps
- We found it more useful to turn on both of cornering lamps when turning the wheel, instead of turning only the side that the steering wheel is oriented.
 - When going backwards with the vehicle or going into tight alleys it is important to have illumination in both sides of the vehicle. Prioritizing safety over cost (of having more LED consumption per hour), we decided to add this feature.
- Different audio for each signal direction.
- Four Amber LED blinking at the same time to represent Hazard lights.

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Conclusions

After this challenge we learnt some electronic, machinery concepts and techniques.

We also improved some soft skills such as communication and how to manage our resources inside the project team.