PiedPiperS project development

https://github.com/jorail/PiedPiperS
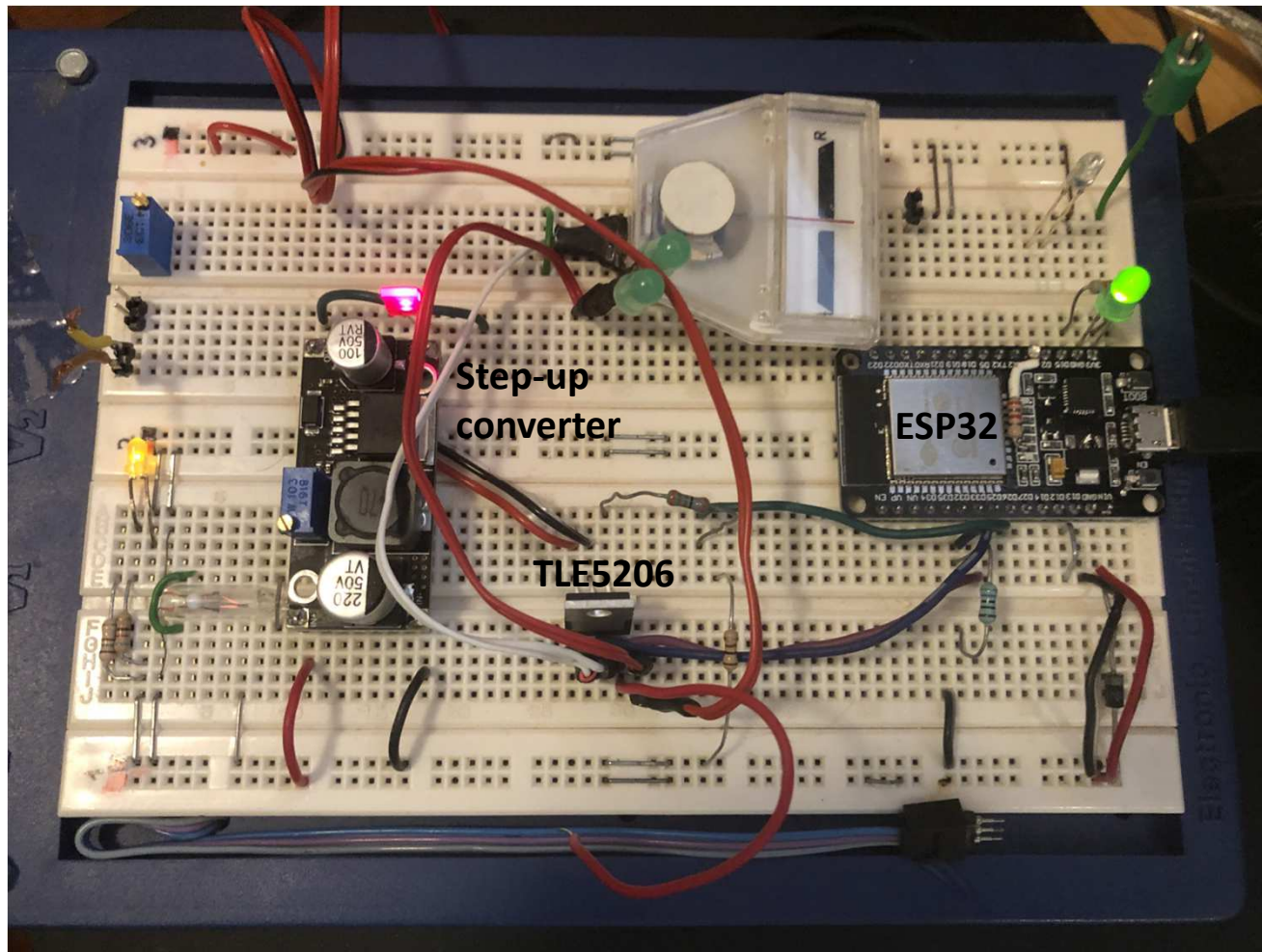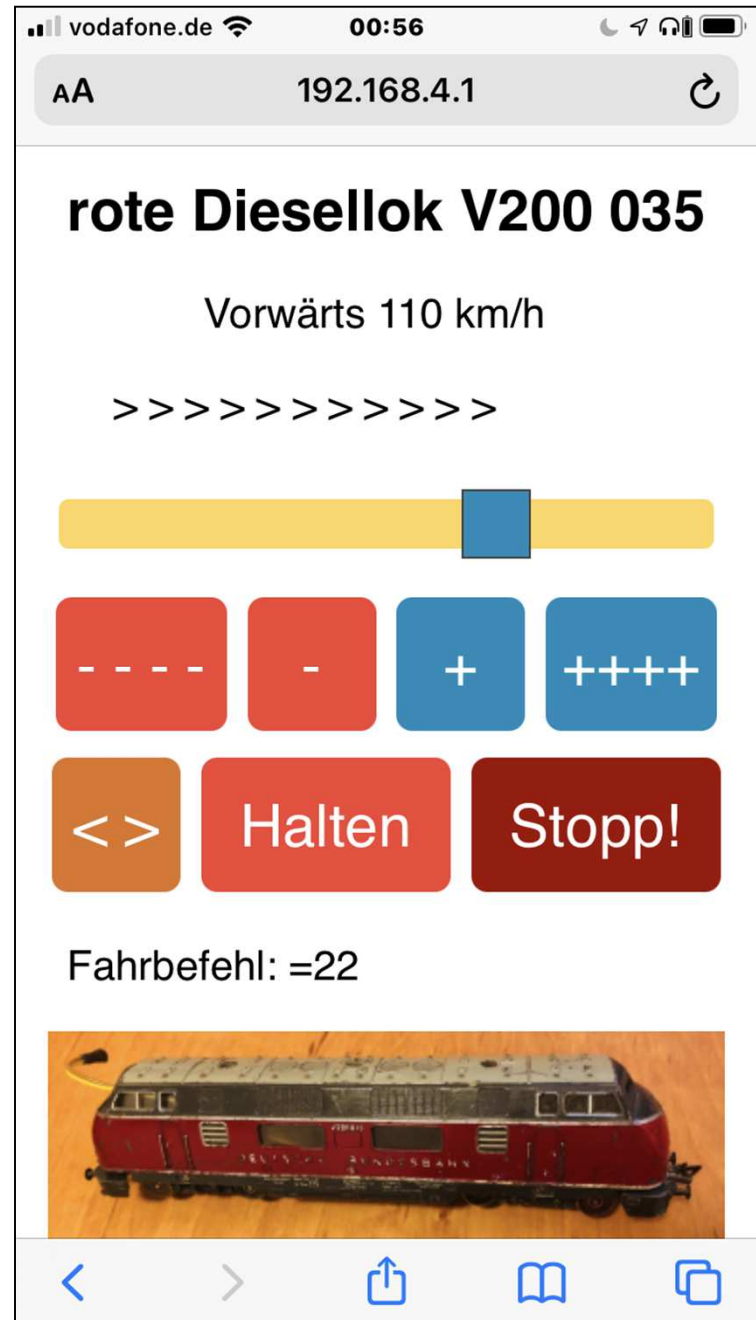
Train control website on smartphone

Material demand
for 1 train with WiFi control

Electronics

- Nano size microcontroller with WiFi
  e.g. ESP32 DevKit V1, etc.
  - 2 PWM outputs for motor control
  - 2 digital outputs for LED indicators
  - 1 digital input for touch switch
  - 1 digital input for motor IC error flag
- Step-up DC/DC converter module, 5 V to 12V … 16 V
- H-Bridge DC motor control IC, e.g. TLE5206-2S
- Small size USB power bank as 5 V DC power supply
  it is good to have two, 2nd for replacement when 1st empty
- Shrink tube with diameter for holding two IC pin contacts
- Thick USB cable, old and used, but reliable for power connection with small voltage drop
- Reuse of 2 on-board LEDs , by soldering 1.5 KΩ resistor from pin
  (or alternatively LEDs: 1 blue, 1 red, 3 mm diameter plus 2 x 1.5 KΩ resistors)
- 1 kΩ resistor as artificial load after LDO
- 1 TVS-diode, 5 V reverse working (standoff) voltage as protection of 5 V input from peak voltages of the Step-up converter
- 2 pole cable, thin and flexible, ca. 40 cm, for connection to motor
- 1 pole wires for breadboard and step up converter connections, ca. 20 cm in total

Other material

- Model train locomotive with 12V … 16 V DC motor
- Flat wagon for electronics equipment
- Eaos high board open wagon for USB power bank
- Some paper cardboard
- Single and double sided adhesive tape

Tools

- Very fine tip solder iron with equipment
- Cutter, fine pincers
- Multi-meter tool

Estimated material cost ca. 20 € excl. other material, tools and additions

ESP32 & TLE5206-2S

integrated mounting and wiring with LDO protection