

“3D-Druck Klappuhr”

Lucas Hahn 941365,
Alexander Petersen 941149



Gliederung

1. Planung & Design

- Komponenten
- Designprozess
- Platine
- Einzelne Ziffer
- Gehäuse

2. Programmcode

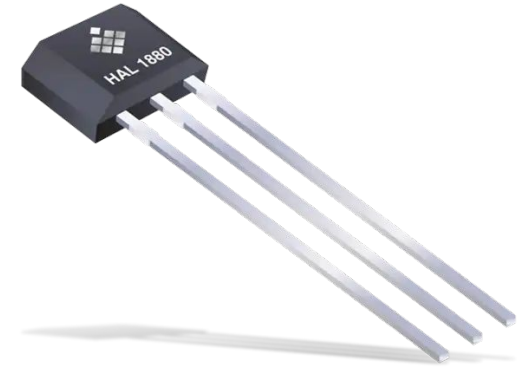
- Sensoren

3. Live-Demo

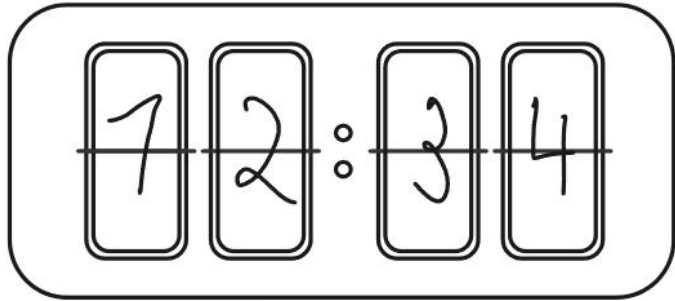
Planung und Design

Komponenten

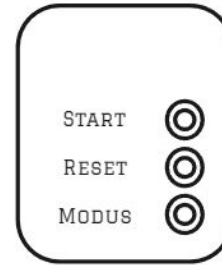
- 4 Sensoren
- 4 Stepper-Motoren
- 1 ESP32
- 1 Schalter
- 3 Knöpfe
- 1 5V-Netzteil



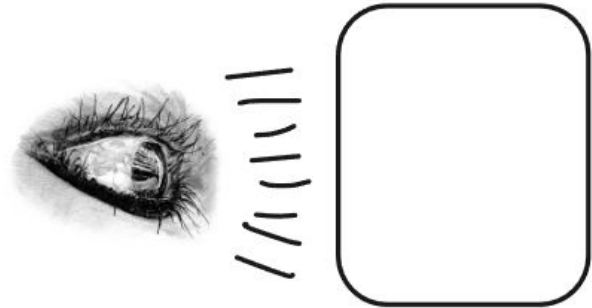
Designprozess



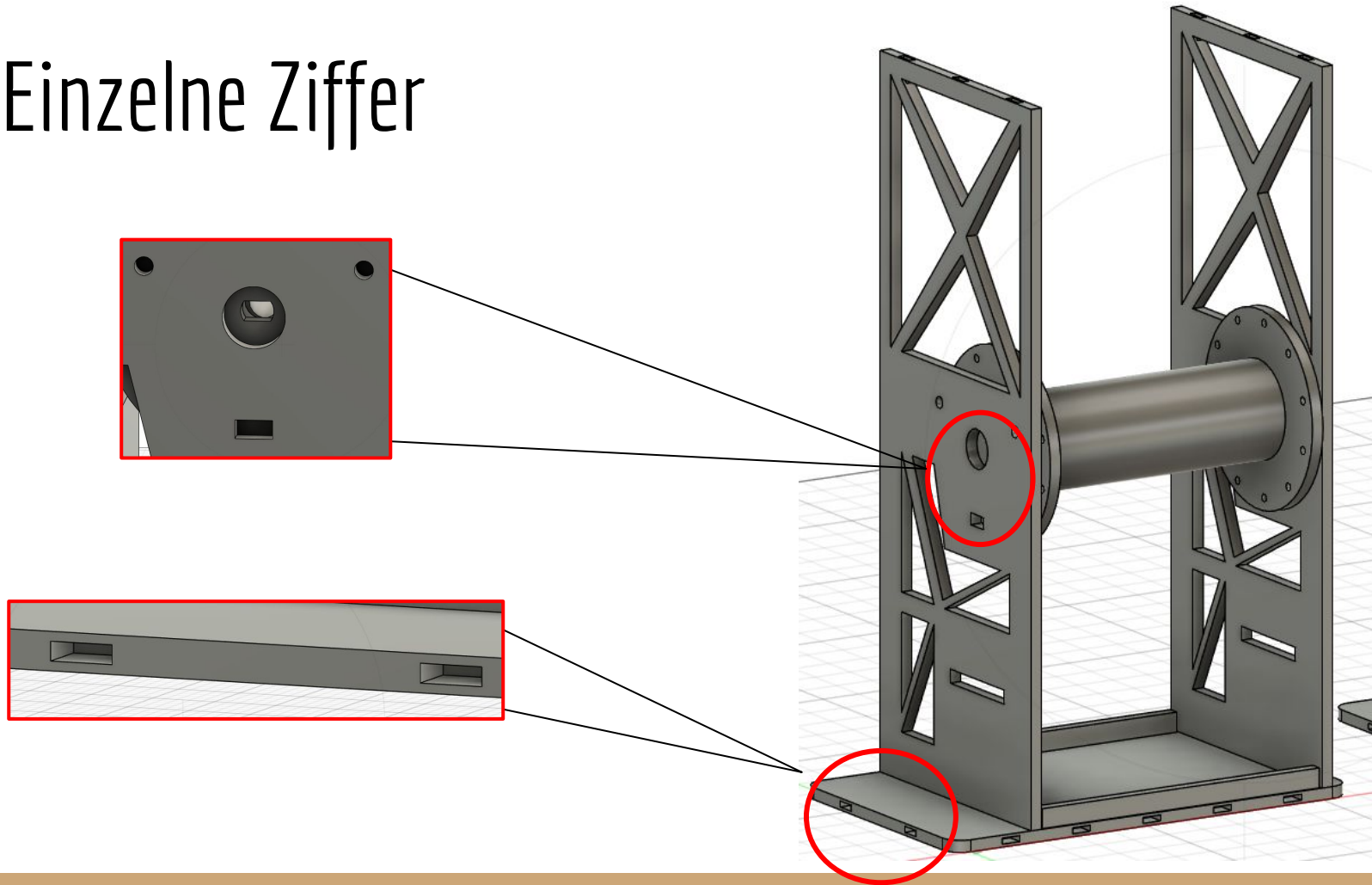
SIDE-L:



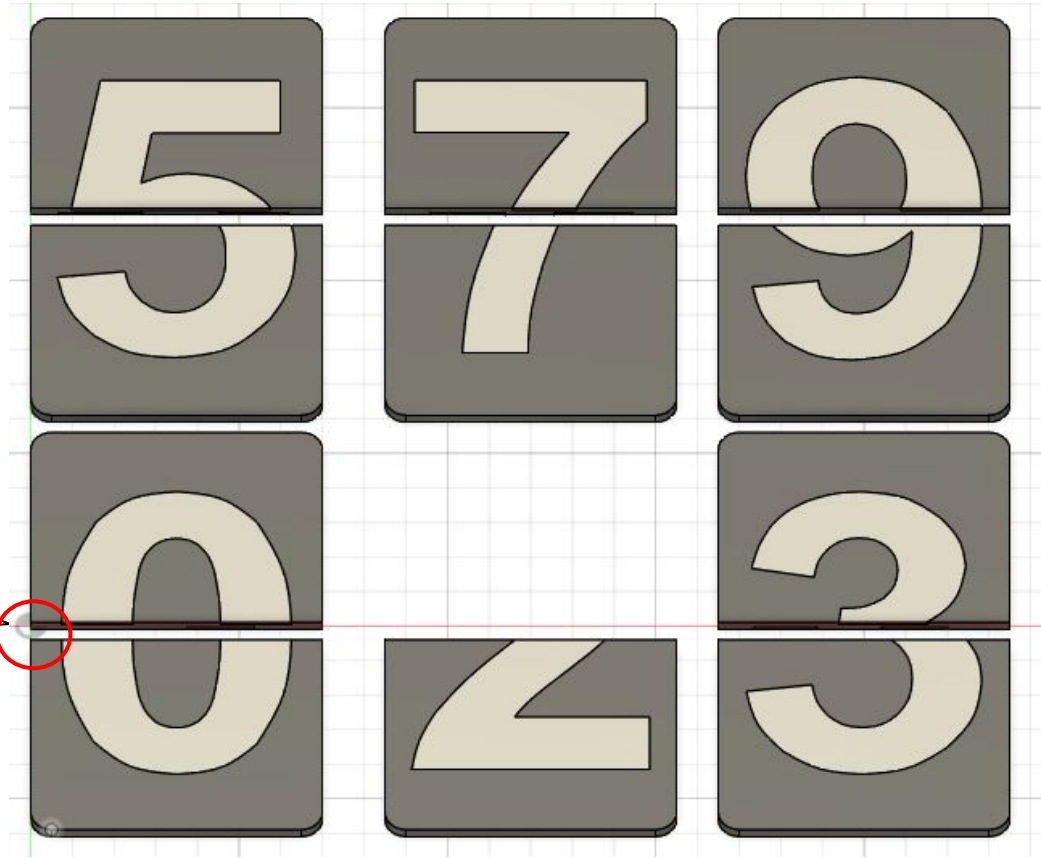
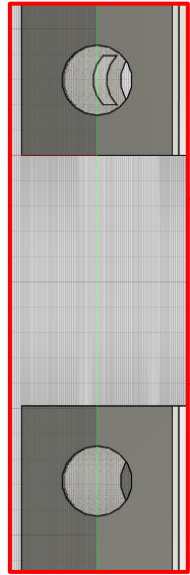
SIDE-R:



Einzelne Ziffer

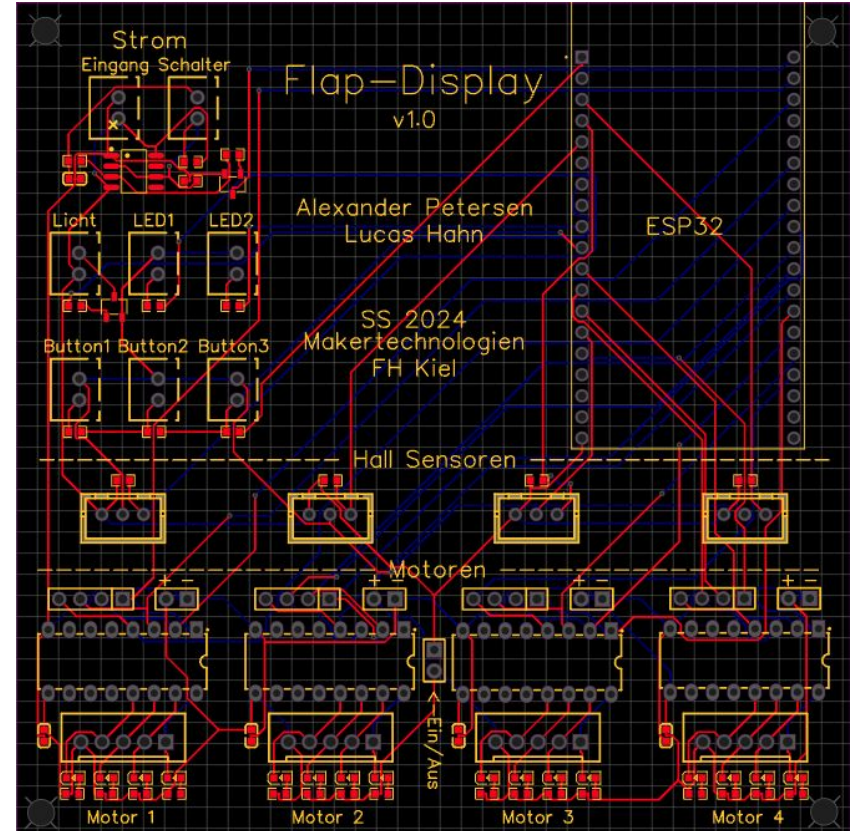
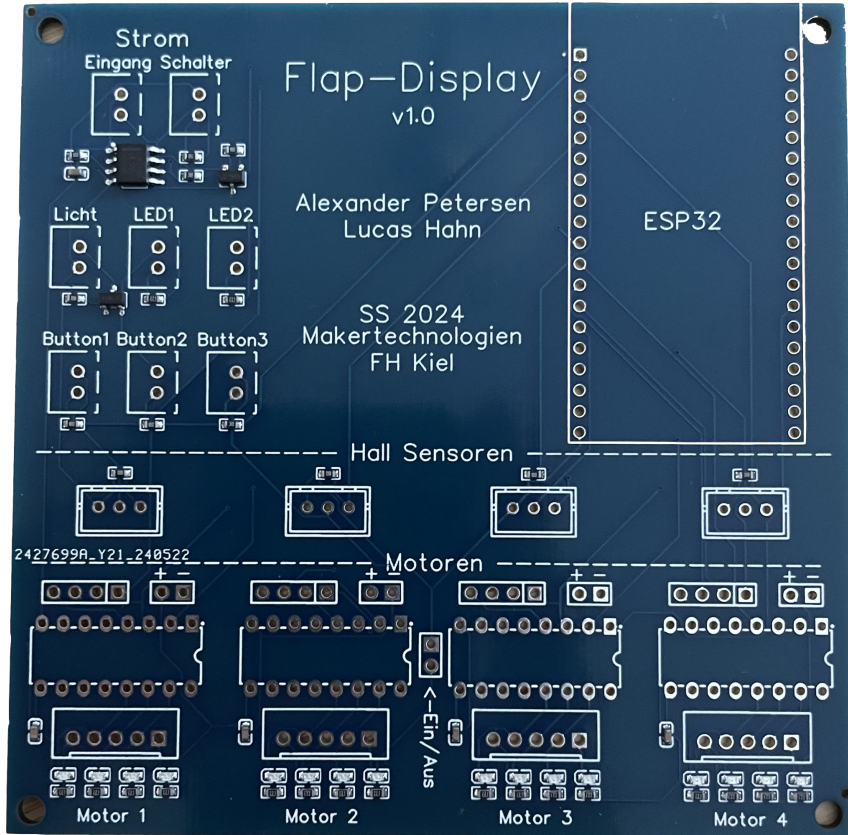


Einzelne Ziffer



Gehäuse

Platine



Programmcode

Sensoren

```
if (!sensor_1_magnet) {
    sensor_1 = digitalRead(hallPin_1);
    calibrateMotor(&stepper1, &sensor_1, &sensor_1_magnet);
}
else if (!sensor_2_magnet) {
    sensor_2 = digitalRead(hallPin_2);
    calibrateMotor(&stepper2, &sensor_2, &sensor_2_magnet);
}
else if (!sensor_3_magnet) {
    sensor_3 = digitalRead(hallPin_3);
    calibrateMotor(&stepper3, &sensor_3, &sensor_3_magnet);
}
else if (!sensor_4_magnet) {
    sensor_4 = digitalRead(hallPin_4);
    calibrateMotor(&stepper4, &sensor_4, &sensor_4_magnet);
}
else {
    digitalWrite(led2, LOW);
    if (millis() - timeLastChecked > timeInterval) {
        updateTime();
        timeLastChecked = millis();
    } else {
        rotateToNumber(&stepper4, "MinutesRight");
        rotateToNumber(&stepper3, "MinutesLeft");
        rotateToNumber(&stepper2, "HoursRight");
        rotateToNumber(&stepper1, "HoursLeft");
    }
}
```

Sensoren

```
void calibrateMotor(AccelStepper *stepper, float *sensor, bool *sensor_magnet) {  
    if (*sensor == LOW) {  
        *sensor_magnet = true;  
        Serial.println("Magnet detected, position set to 0");  
        stepper->setCurrentPosition(0);  
  
        if (isStepperInReverseList(stepper)) {  
            adjustPosition(stepper, -33);  
        } else if (stepper == &stepper4) {  
            adjustPosition(stepper, 30);  
        } else {  
            adjustPosition(stepper, 15);  
        }  
    } else {  
        // Keep the motor running  
        if (isStepperInReverseList(stepper)) {  
            stepper->setSpeed(-speed * 4); // turn backwards  
        } else {  
            stepper->setSpeed(speed * 4);  
        }  
  
        stepper->runSpeed();  
    }  
}
```

Live-Demo

Danke für eure
Aufmerksamkeit