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## DAFTAR LAMPIRAN

Lampiran 1 Program pseudocode

Initialize library

```
#include <Wire.h>
```

```
#include <Adafruit_GFX.h>
```

```
#include <Adafruit_SSD1306.h>
```

Initialize constants and variables:

```
SCREEN_WIDTH = 128
```

```
SCREEN_HEIGHT = 64
```

```
OLED_RESET = -1
```

```
relayA1 = 22
```

```
relayA2 = 23
```

```
relayR1 = 24
```

```
relayR2 = 25
```

```
relayR3 = 26
```

```
relayR4 = 27
```

```
RENki = 5
```

```
LENki = 4
```

```
RPWMki = 2
```

```
LPWMki = 3
```

```
RENka = 9
```

```
LENka = 8
```

```
RPWMka = 6
```

```
LPWMka = 7
```

```
led = 11
```

```
ldr = 10
```

```
dsm = 52
```

```
trig1 = 28
```

```
trig2 = 30
```

```
trig3 = 32
```

```
trig4 = 34
```

```
echo1 = 29
```

```
echo2 = 31
```

```
echo3 = 33
```

```
echo4 = 35
```

Initialize durations and distances

Initialize starttime, samptime\_ms, lowpulseoccupancy, ratio, concentration1, concentration2, sensordata, remote1, remote2, remote3, remote4, speedA, speedB

Setup:

Begin Serial communication at 9600 baud rate  
Initialize display with given parameters  
Clear display and set text color to WHITE  
Initialize pin modes (INPUT/OUTPUT) for relays, sensors, and LEDs  
Set starttime to current millis

Loop:

Clear display  
Read sensor data and remote control states

Measure distances using ultrasonic sensors:  
Trigger each sensor in sequence (trig1 to trig4)  
Measure pulse duration and calculate distance  
Delay between measurements

Control LED based on LDR sensor data

Control relays based on remote control states

Navigate based on distance and air quality data:

If remote4 is active:

Control relayA1 based on concentration1

Navigate based on distances (distance1, distance2, distance3, distance4)

Else:

Freeze

Display distances and air quality data on OLED  
Measure air quality using DSM sensor  
Calculate concentration based on pulse occupancy  
Display air quality status and control motor speeds

Update starttime

Functions:

forward:

Set motors to move forward with speeds speedA and speedB

backward:

Set motors to move backward with speeds speedA and speedB

right:

Set motors to turn right with speeds speedA and speedB

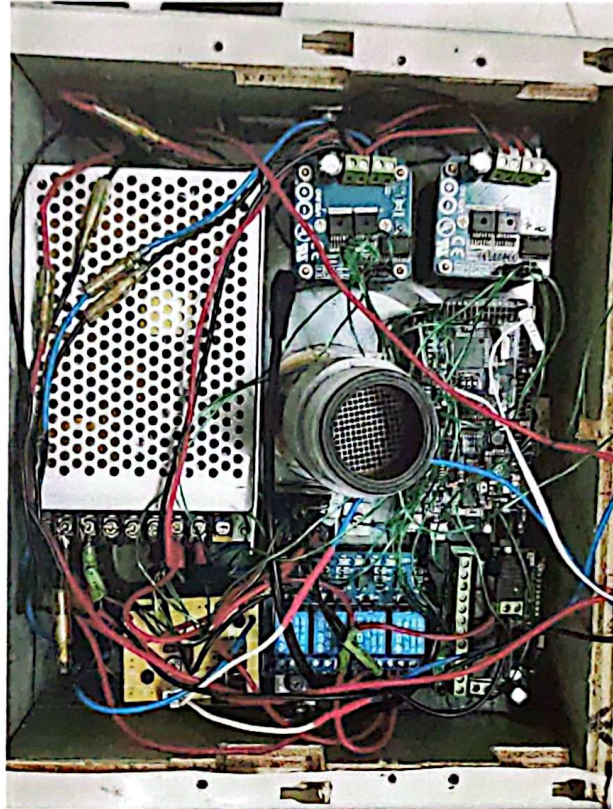
left:

Set motors to turn left with speeds speedA and speedB

freeze:

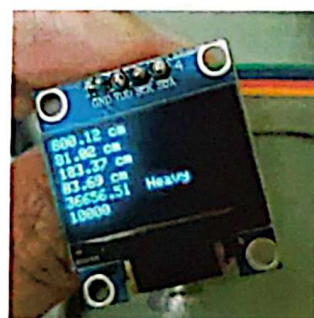
Stop all motors

Lampiran 2. Control Room E-MAGiC



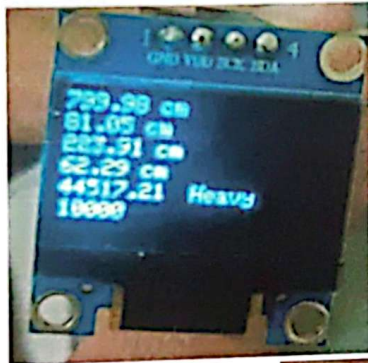
Lampiran 3. Uji Sensor

- Pada Rak Telur

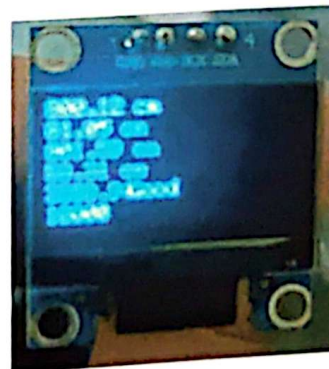




- Pada Kertas



- Pada Obat Nyamuk Bakar



- Pada Lidi



- Pada Lilin

