

CHAPTER 5

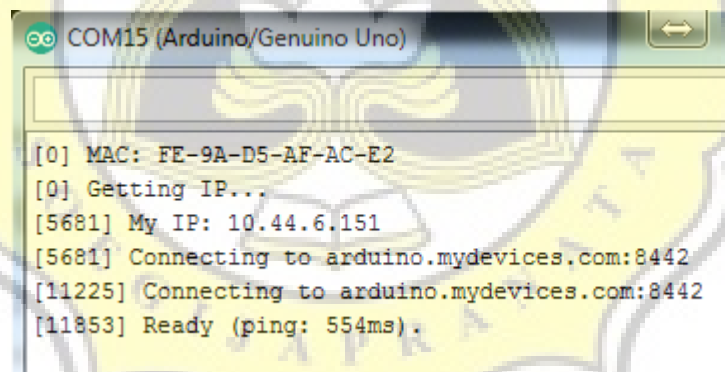
IMPLEMENTATION AND TESTING

5.1 Implementation

This project uses arduino IDE application to do programming in arduino mikrokontroler Programs that have been uploaded to arduino for this project, can be seen below.

The first program run by arduino is to request IP to the router, then arduino will display the mac address and IP obtained. Once the arduino gets an IP, the arduino sends the token to the IoT server to match it to the existing token in server. If the entered tokens are correct then the arduino will display the words "

[5681] Connecting to arduino.mydevices.com:8442, [7522] Ready (ping: ***ms)".



```

COM15 (Arduino/Genuino Uno)

[0] MAC: FE-9A-D5-AF-AC-E2
[0] Getting IP...
[5681] My IP: 10.44.6.151
[5681] Connecting to arduino.mydevices.com:8442
[11225] Connecting to arduino.mydevices.com:8442
[11853] Ready (ping: 554ms).
  
```

Illustration 5.1: Connection status

The next program is arduino will check whether there is input from IoT server or not. If the IoT server provides input, then the arduino will give the command to turn the relay and rotate the pipe 90° so that the hole in the pipe will be facing down. If the IoT server does not provide input then the arduino will give the relay command to turn off and the servo turns 90° then the arduino will check the moisture of the soil whether it is dry or moist. If the soil is dry then the arduino will command the relay to turn on and the pipe rotate down for some time so the water that comes out is not too much. after that the arduino will order the

relay to turn off and the pipe rotate up and check the input status from the server. But if the ground is moist then the arduino will immediately check the status of input. Data obtained from all sensors is sent to the IoT server. The data sent is the soil moisture value of the two plants and the total water released.

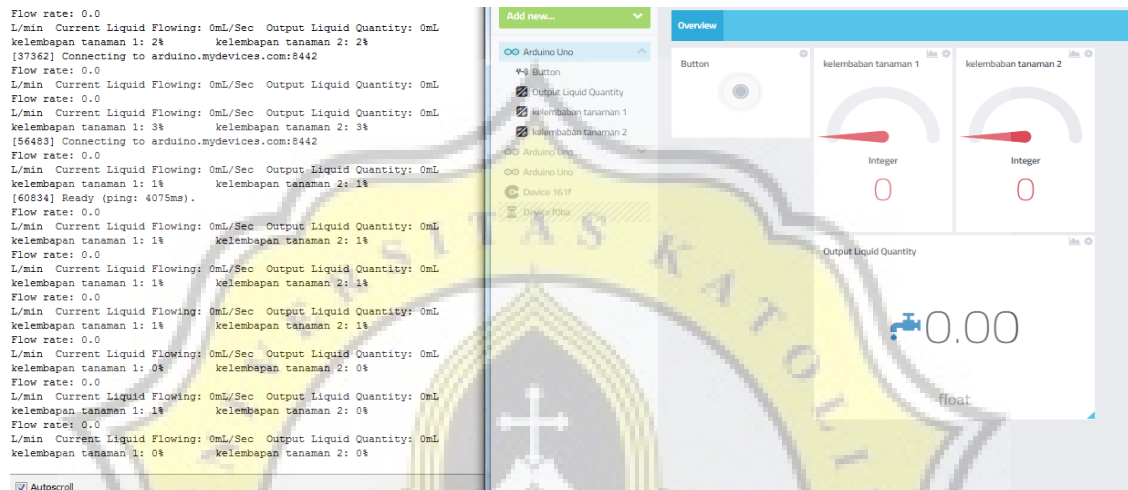


Illustration 5.2: Read data from sensors displayed on screen and in IoT server display

5.2 Testing

When the arduino is first run, the arduino will request the IP from the router. After the arduino IP will check the input from the server. If the server does not give input, arduino will immediately check the ground moisture.

```
[0] MAC: FE-E6-69-CF-A6-9C
[0] Getting IP...
[2023] My IP: 192.168.41.97
      SENSOR MENYALA DAN MULAI MEMBACA!
Flow rate: 0.1
L/min Current Liquid Flowing: 1mL/Sec Output Liquid Quantity: 0mL
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 43%
Flow rate: 0.0
L/min Current Liquid Flowing: 0mL/Sec Output Liquid Quantity: 0mL
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 43%
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 43%
Flow rate: 0.0
L/min Current Liquid Flowing: 0mL/Sec Output Liquid Quantity: 0mL
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 43%
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 42%
Flow rate: 0.0
L/min Current Liquid Flowing: 0mL/Sec Output Liquid Quantity: 0mL
kelembapan tanaman 1: 49%      kelembapan tanaman 2: 43%
[5358] Connecting to arduino.mydevices.com:8442
Flow rate: 0.0
```

Illustration 5.3: Arduino Get IP

If the sensor reads the soil moisture value above 40 then the ground is moist, the relay will be off and the servo will be facing upwards.

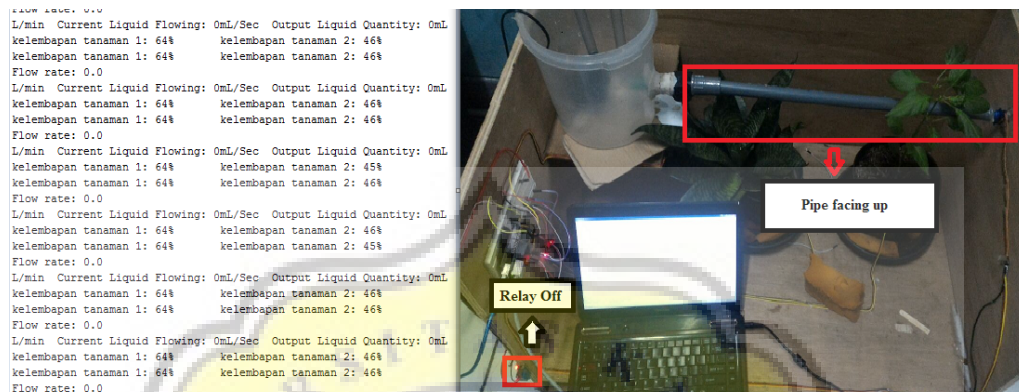


Illustration 5.4: the ground is moist

If the sensor reads the soil moisture value below 40 then the ground is dry the relay will on and the servo will face down.

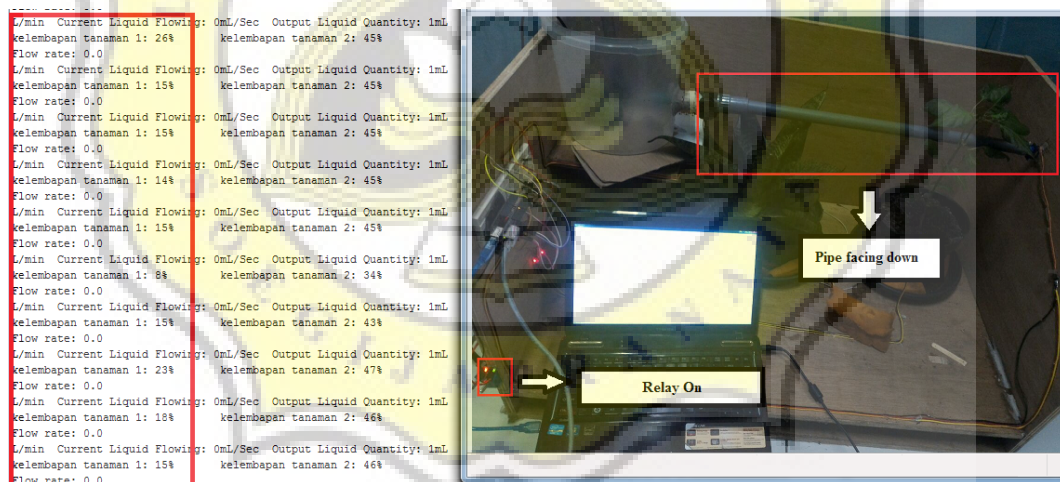


Illustration 5.5: The ground is dry

When the server gives input for watering, the relay will be on and the pipe will face down until the server gives the input to stop.

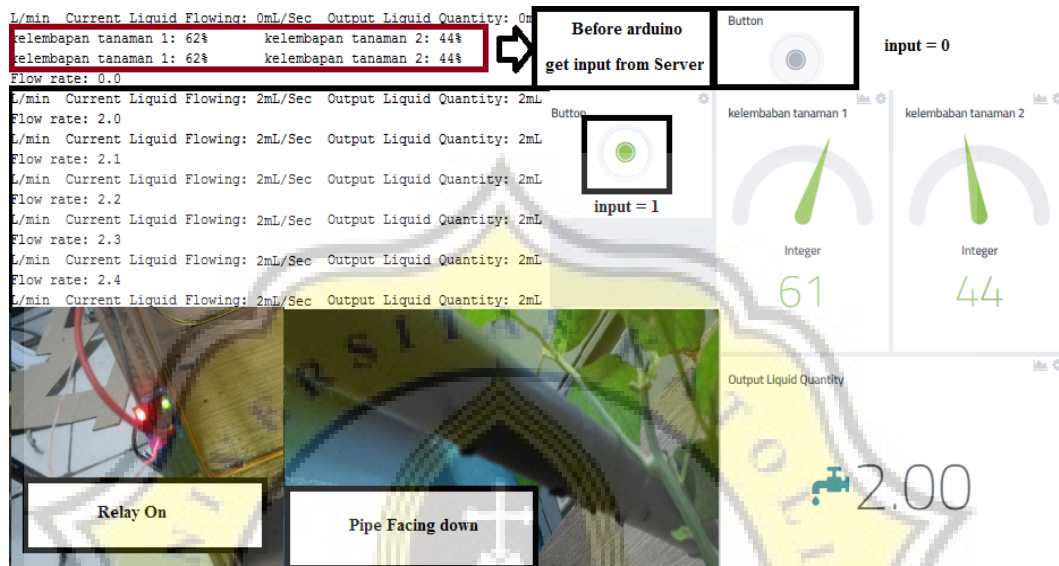


Illustration 5.6: Arduino provide input