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**Group: Four (4)**

**LAB 5**

**Course: Industry 4.0 Enabling Technologies**

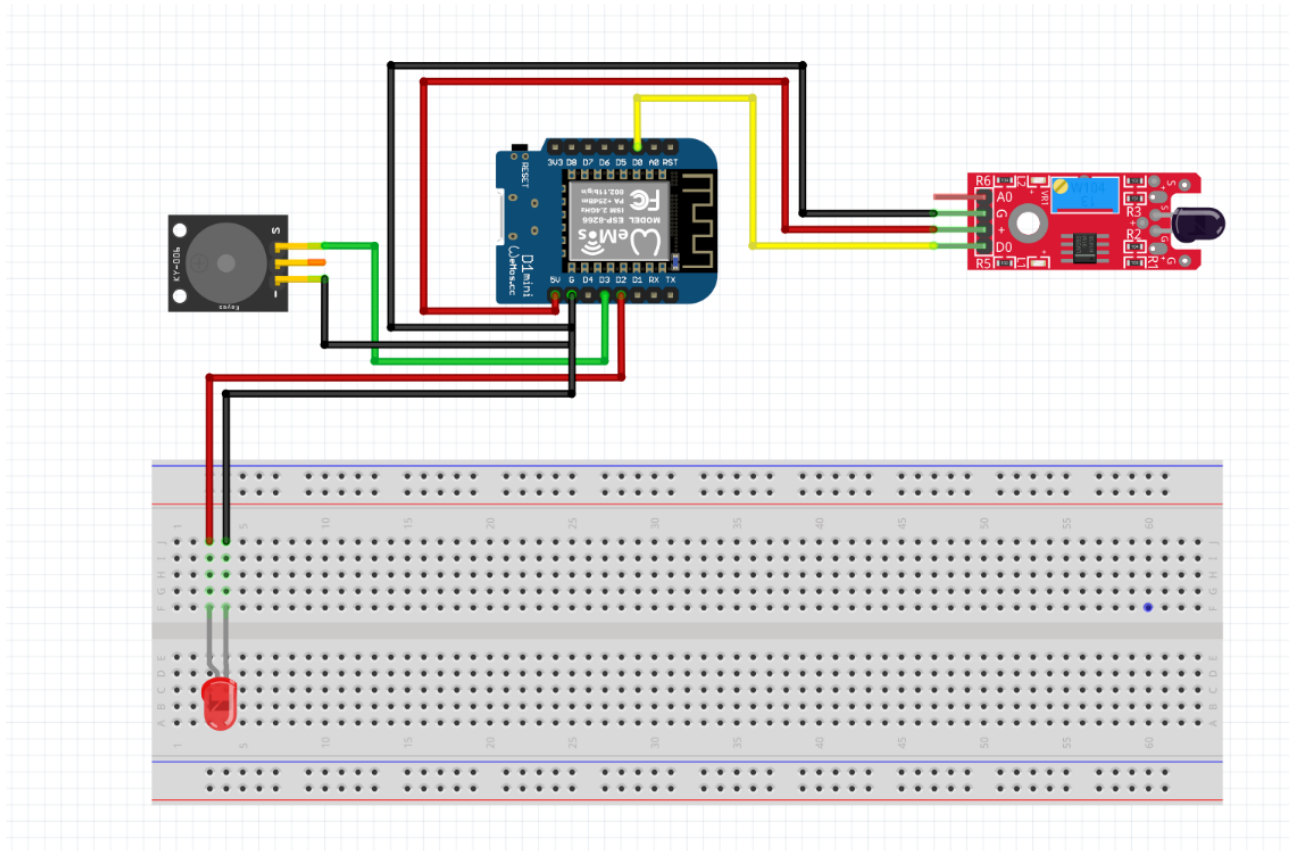


Figure 1. Screenshot of the Fritzing design for each IoT node

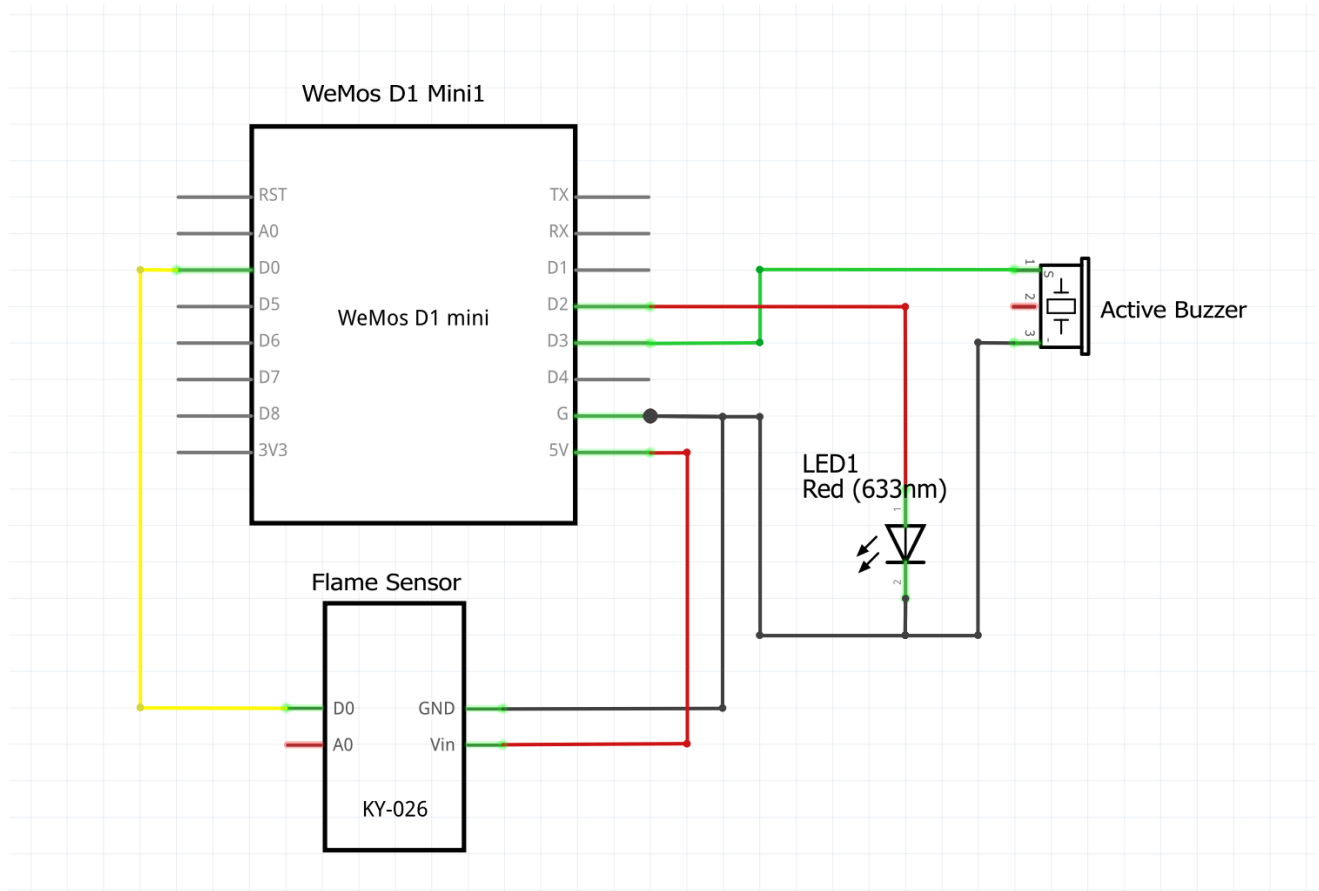
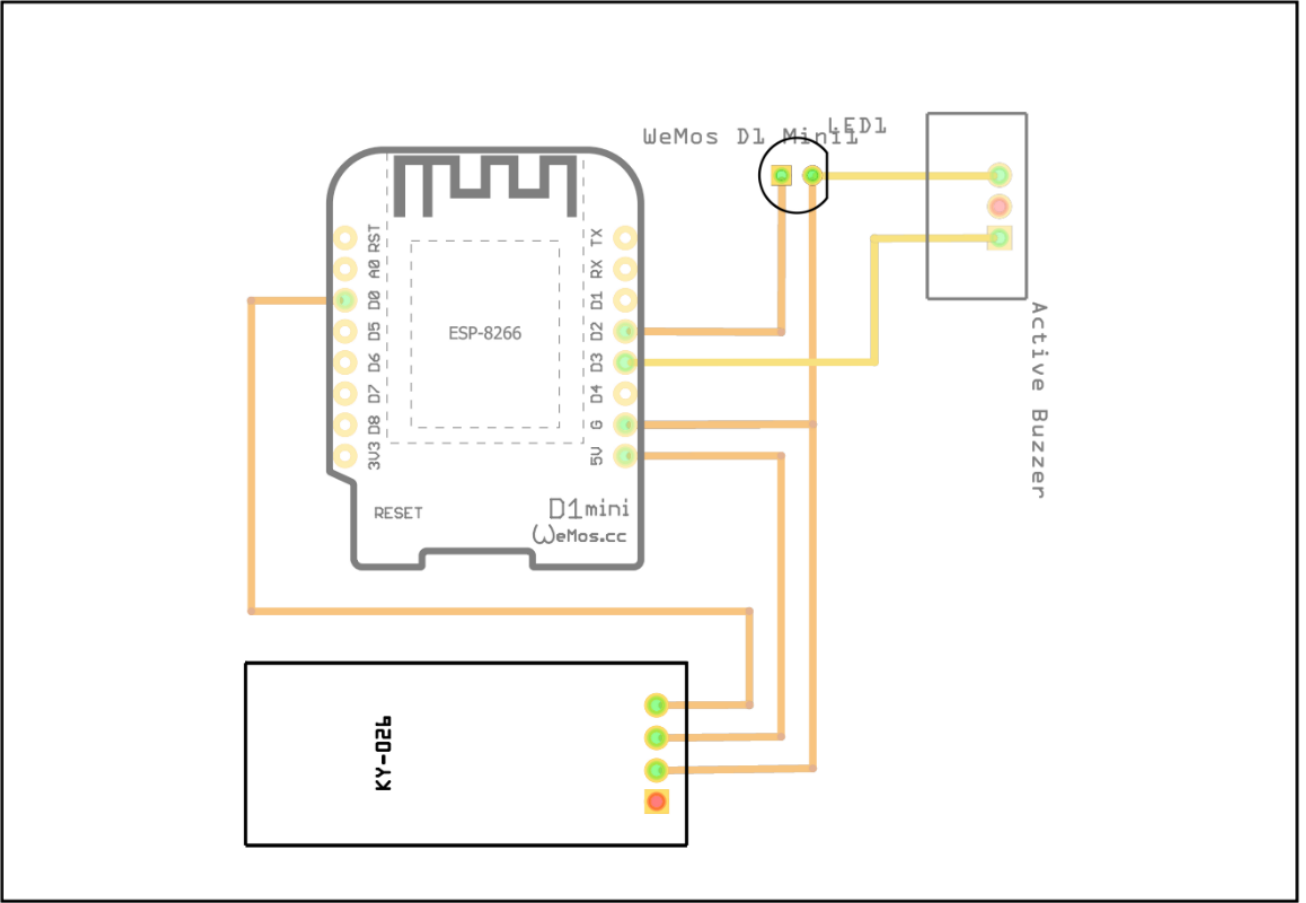


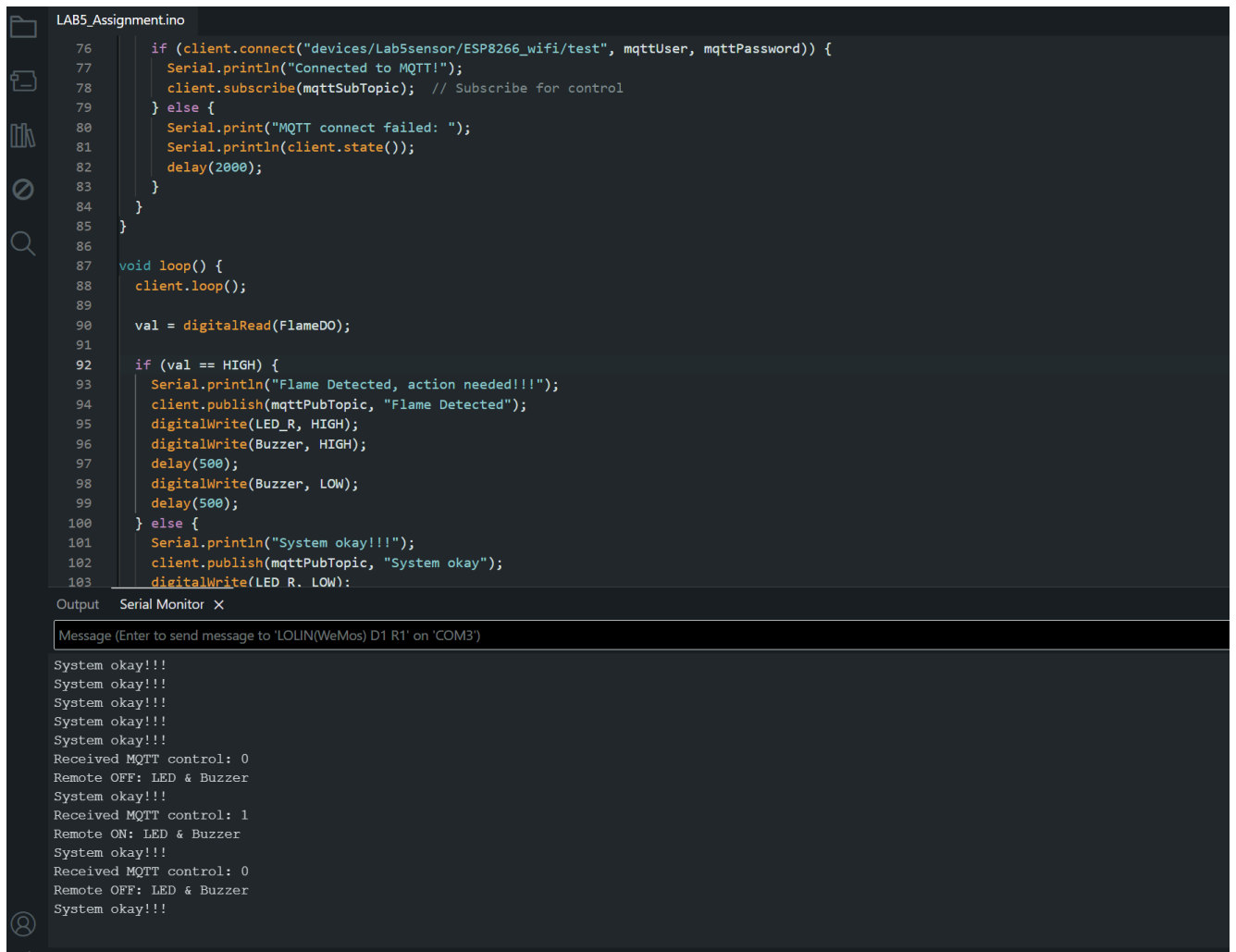
Figure 2. Screenshot of the Fritzing Schematic of each IoT node



Flame Sensor

fritzing

Figure 3. Screenshot of the Fritzing PCB of each IoT node



```
LAB5_Assignmentino
76   if (client.connect("devices/Lab5sensor/ESP8266_wifi/test", mqttUser, mqttPassword)) {
77       Serial.println("Connected to MQTT!");
78       client.subscribe(mqttSubTopic); // Subscribe for control
79   } else {
80       Serial.print("MQTT connect failed: ");
81       Serial.println(client.state());
82       delay(2000);
83   }
84 }
85 }
86
87 void loop() {
88     client.loop();
89
90     val = digitalRead(FlameDO);
91
92     if (val == HIGH) {
93         Serial.println("Flame Detected, action needed!!!");
94         client.publish(mqttPubTopic, "Flame Detected");
95         digitalWrite(LED_R, HIGH);
96         digitalWrite(Buzzer, HIGH);
97         delay(500);
98         digitalWrite(Buzzer, LOW);
99         delay(500);
100    } else {
101        Serial.println("System okay!!!");
102        client.publish(mqttPubTopic, "System okay");
103        digitalWrite(LED_R, LOW);
104    }
105 }
```

Output Serial Monitor X

Message (Enter to send message to 'LOLIN(WeMos) D1 R1' on 'COM3')

System okay!!!  
System okay!!!  
System okay!!!  
System okay!!!  
System okay!!!  
Received MQTT control: 0  
Remote OFF: LED & Buzzer  
System okay!!!  
Received MQTT control: 1  
Remote ON: LED & Buzzer  
System okay!!!  
Received MQTT control: 0  
Remote OFF: LED & Buzzer  
System okay!!!

Figure 4. Screenshot of the Arduino IDE Serial monitor displaying command from FlowFuse

```
LAB5_Assignment.ino
81     Serial.println(client.state());
82     delay(2000);
83 }
84 }
85 }
86
87 void loop() {
88     client.loop();
89
90     val = digitalRead(FlameDO);
91
92     if (val == LOW) {
93         Serial.println("Flame Detected, action needed!!!");
94         client.publish(mqttPubTopic, "Flame Detected");
95         digitalWrite(LED_R, HIGH);
96         digitalWrite(Buzzer, HIGH);
97         delay(500);
98         digitalWrite(Buzzer, LOW);
99         delay(500);
100     } else {
101         Serial.println("System okay!!!");
102         client.publish(mqttPubTopic, "System okay");
103         digitalWrite(LED_R, LOW);
104         digitalWrite(Buzzer, LOW);
105         delay(2000);
106     }
107 }
108
```

Output Serial Monitor X

Message (Enter to send message to 'LOLIN(WeMos) D1 R1' on 'COM3')

```
Remote ON: LED & Buzzer
Flame Detected, action needed!!!
Received MQTT control: 0
Remote OFF: LED & Buzzer
Flame Detected, action needed!!!
Received MQTT control: 1
Remote ON: LED & Buzzer
Flame Detected, action needed!!!
Received MQTT control: 0
Remote OFF: LED & Buzzer
Flame Detected, action needed!!!
Received MQTT control: 1
Remote ON: LED & Buzzer
Flame Detected, action needed!!!
Flame Detected, action needed!!!
```

Figure 5. Screenshot of the Arduino IDE Serial monitor displaying command from FlowFuse

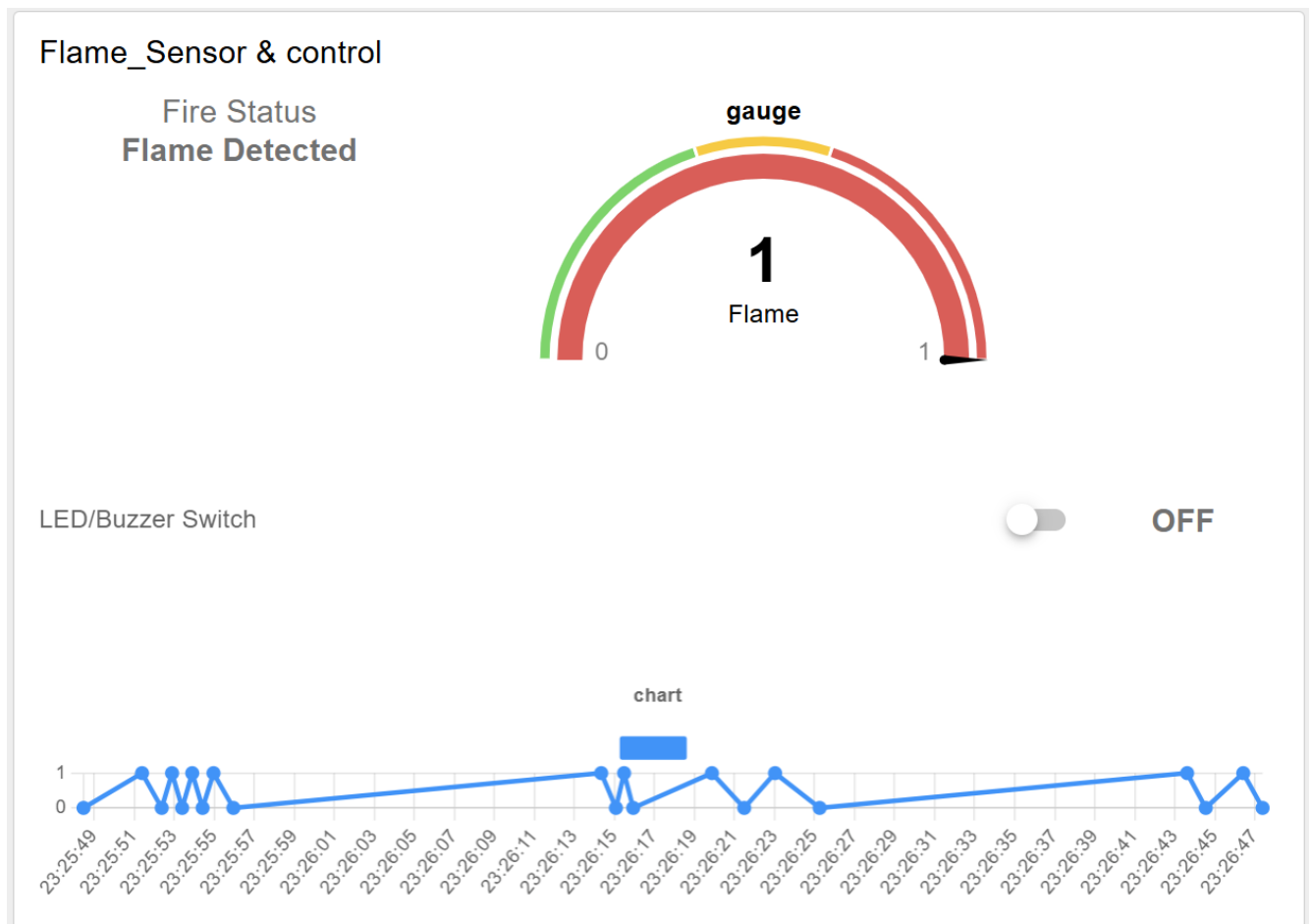


Figure 6. Screenshot displaying dashboard from FlowFuse

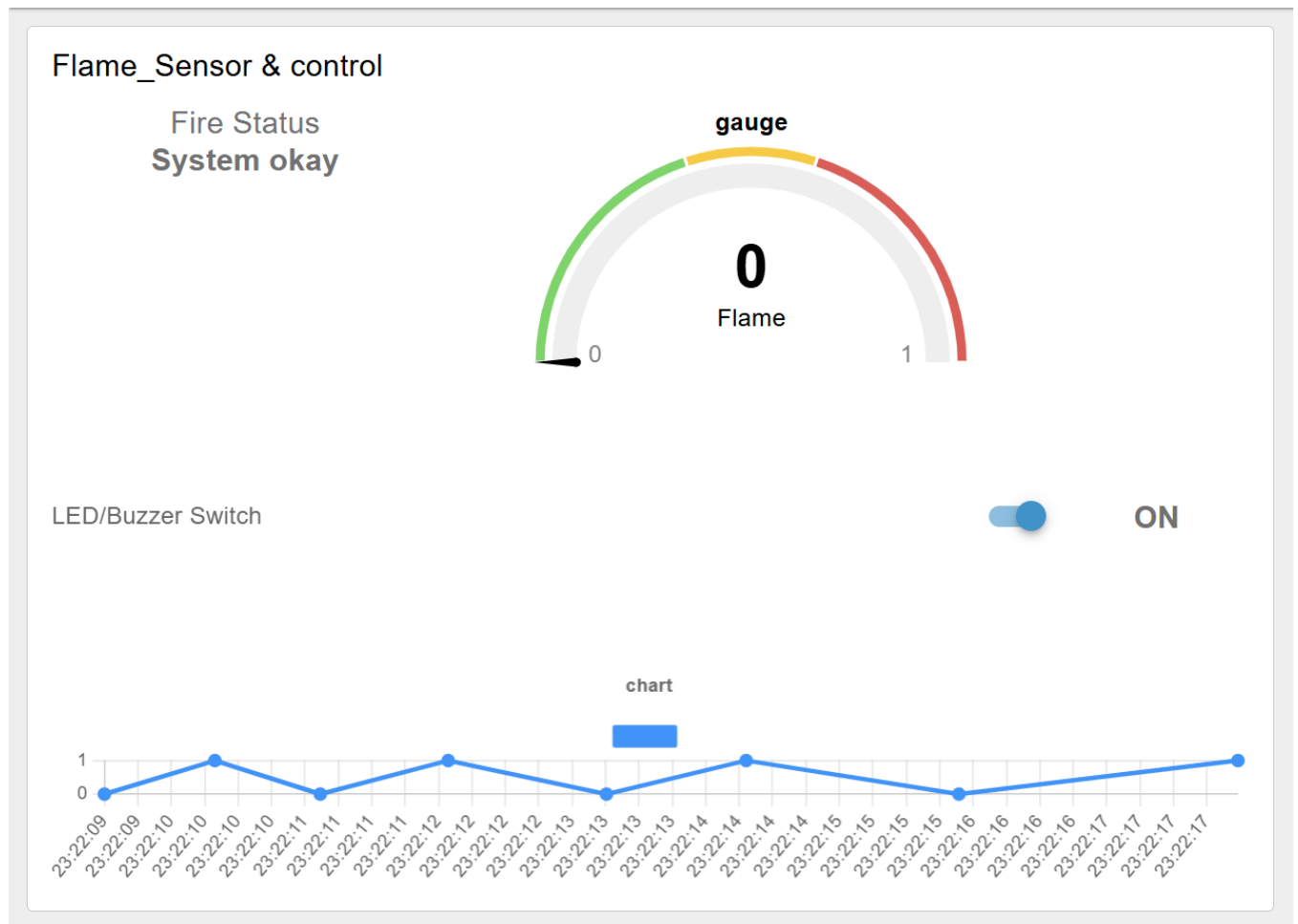


Figure 6. Screenshot displaying dashboard from FlowFuse