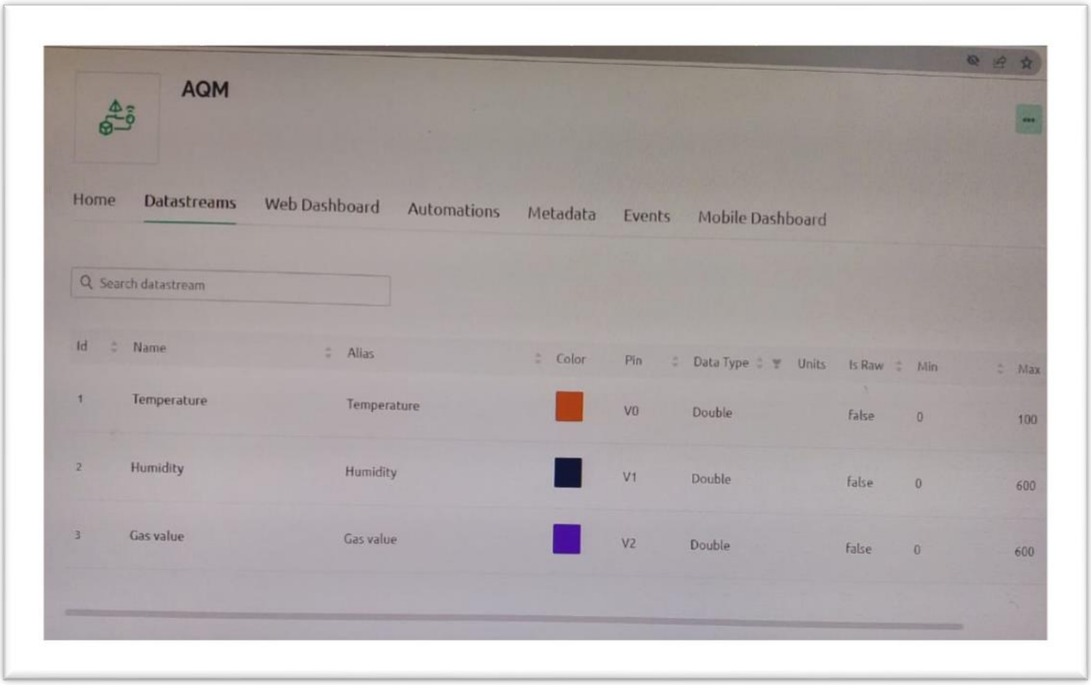
Air Quality Monitoring

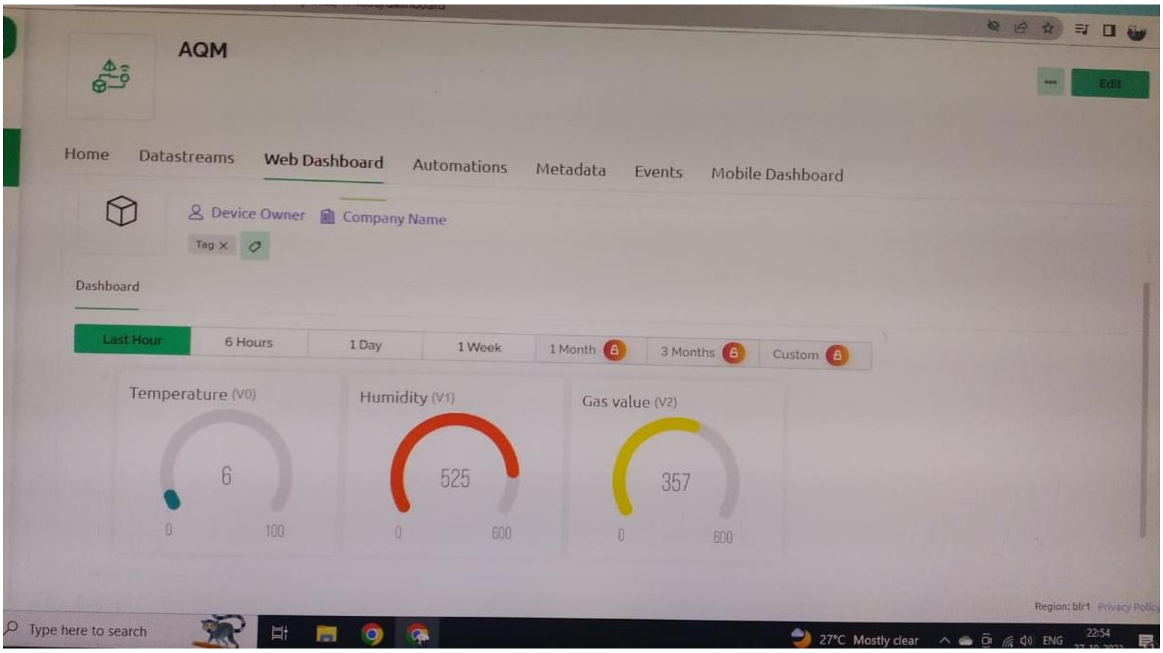
```
#include "MQ135.h"

#include <SoftwareSerial.h>

#define DEBUG true

SoftwareSerial esp8266(9,10); // This makes pin 9 of Arduino as RX pin and pin 10 of Arduino as the TX pin

const int sensorPin= 0;

int air_quality;

#include <LiquidCrystal.h>

LiquidCrystal lcd(12,11, 5, 4, 3, 2);

void setup() {

pinMode(8, OUTPUT);

lcd.begin(16,2);

lcd.setCursor (0,0);

lcd.print ("circuitdigest ");

lcd.setCursor (0,1);

lcd.print ("Sensor Warming ");

delay(1000);

Serial.begin(115200);

esp8266.begin(115200); // your esp's baud rate might be different

  sendData("AT+RST\r\n",2000,DEBUG); // reset module

  sendData("AT+CWMODE=2\r\n",1000,DEBUG); // configure as access point

  sendData("AT+CIFSR\r\n",1000,DEBUG); // get ip address

  sendData("AT+CIPMUair_quality=1\r\n",1000,DEBUG); // configure for multiple connections

  sendData("AT+CIPSERVER=1,80\r\n",1000,DEBUG); // turn on server on port 80

pinMode(sensorPin, INPUT);        //Gas sensor will be an input to the arduino

lcd.clear();
```

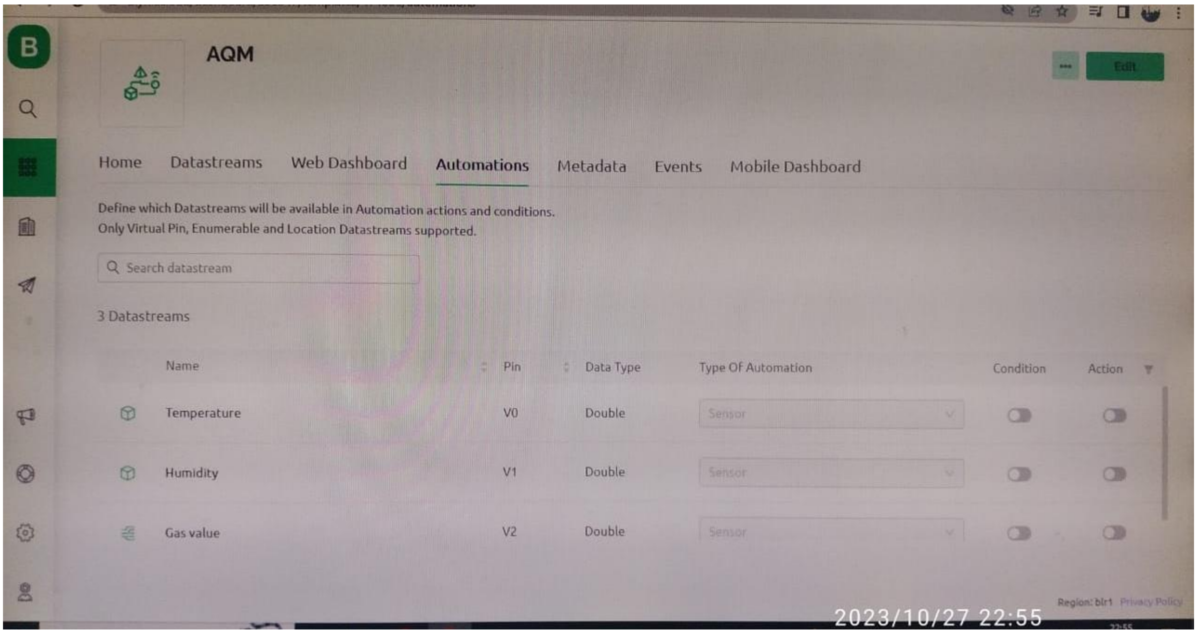
```
}
void loop() {
MQ135 gasSensor = MQ135(A0);
float air_quality = gasSensor.getPPM();
if(esp8266.available()) // check if the esp is sending a message
  {
  if(esp8266.find("+IPD,"))
  {
    delay(1000);
    int connectionId = esp8266.read()-48; /* We are subtracting 48 from the output because
the read() function returns the ASCII decimal value and the first decimal number which is 0
starts at 48*/
    String webpage = "<h1>IOT Air Pollution Monitoring System</h1>";
      webpage += "<p><h2>";
       webpage+= " Air Quality is ";
      webpage+= air_quality;
      webpage+=" PPM";
      webpage += "<p>";
    if (air_quality<=1000)
{
  webpage+= "Fresh Air";
}
else if(air_quality<=2000 && air_quality>=1000)
{
  webpage+= "Poor Air";
}
else if (air_quality>=2000 )
{
webpage+= "Danger! Move to Fresh Air";
}
webpage  += "</h2></p></body>";
   String cipSend = "AT+CIPSEND=";
   cipSend += connectionId;
    cipSend += ",";
    cipSend +=webpage.length();
    cipSend +="\r\n";
    sendData(cipSend,1000,DEBUG);
    sendData(webpage,1000,DEBUG);
    cipSend = "AT+CIPSEND=";
    cipSend += connectionId;
    cipSend += ",";
    cipSend +=webpage.length();
    cipSend +="\r\n";
   String closeCommand = "AT+CIPCLOSE=";
    closeCommand+=connectionId; // append connection id
    closeCommand+="\r\n";
    sendData(closeCommand,3000,DEBUG);
   }
  }
lcd.setCursor (0, 0);
lcd.print ("Air Quality is ");
lcd.print (air_quality);
lcd.print (" PPM ");
lcd.setCursor (0,1);
if (air_quality<=1000)
{
lcd.print("Fresh Air");
digitalWrite(8, LOW);
}
```

```
else if( air_quality>=1000 && air_quality<=2000 )
{
lcd.print("Poor Air, Open Windows");
digitalWrite(8, HIGH );
}
else if (air_quality>=2000 )
{
lcd.print("Danger! Move to Fresh Air");
digitalWrite(8, HIGH);  // turn the LED on
}
lcd.scrollDisplayLeft();
delay(1000);
}
String sendData(String command, const int timeout, boolean debug)
{
    String response = "";
    esp8266.print(command); // send the read character to the esp8266
    long int time = millis();
    while( (time+timeout) > millis())
   {
     while(esp8266.available())
      {
       // The esp has data so display its output to the serial window
         char c = esp8266.read(); // read the next character.
        response+=c;
     }
     }
    if(debug)
    {
      Serial.print(response);
    }
    return response;
}
```



Id	Name	Alias	Color	Pin	Data Type	Units	Is Raw	Min	Max
1	Temperature	Temperature	🟧	V0	Double		false	0	100
2	Humidity	Humidity	⬛	V1	Double		false	0	600
3	Gas value	Gas value	🟪	V2	Double		false	0	600





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3 Datastreams

Name	Pin	Data Type	Type Of Automation	Condition	Action
Temperature	V0	Double	Sensor	○	○
Humidity	V1	Double	Sensor	○	○
Gas value	V2	Double	Sensor	○	○

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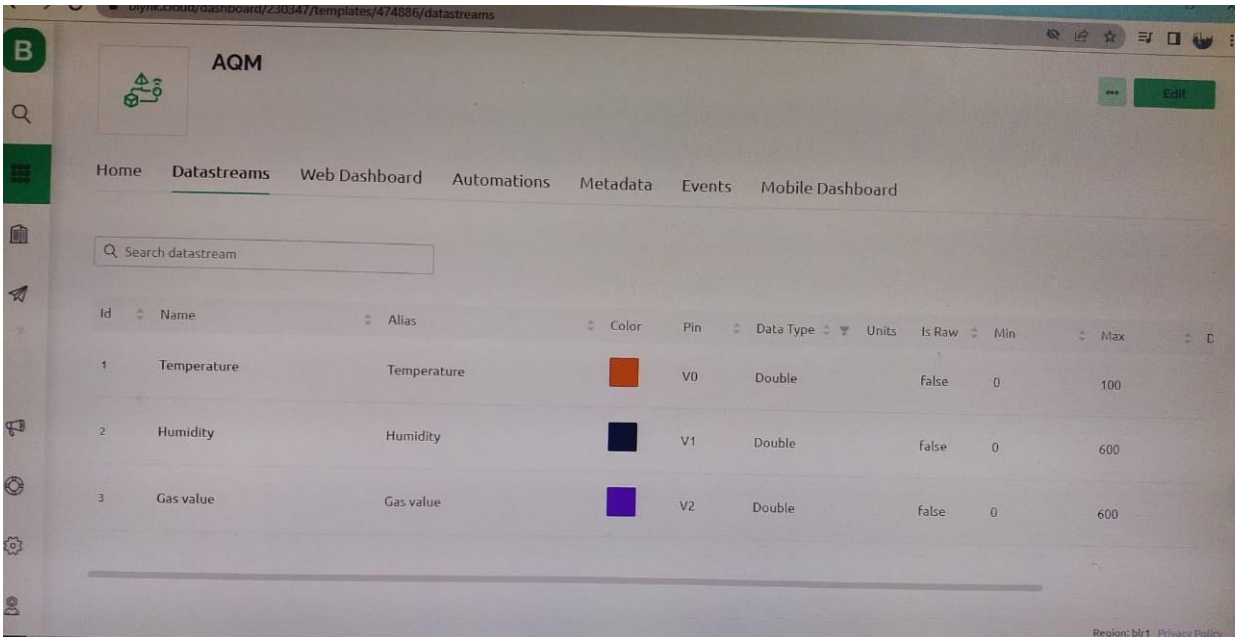

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