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/**************************************
  IoT BASED TRANSFORMER HEALTH MONITORING
  SENSORS:
  - DHT11 Temperature
  - ACS712 Current Sensor
  - Voltage Divider Sensor
  - Oil Level (Analog / Digital)
  - ESP8266 WiFi Module (AT Commands)
**************************************/

#include <DHT.h>
#define DHTPIN 2
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);

// Sensor Pins
Int voltagePin = A0;
Int currentPin = A1;
Int oilPin     = A2;

// WiFi Credentials
String WIFI_SSID = “Your_WiFi_Name”;
String WIFI_PASS = “Your_WiFi_Password”;

// ThingSpeak API
String API_KEY = “YOUR_THINGSPEAK_API_KEY”;
```

```
Void setup() {
  Serial.begin(9600);
  Dht.begin();

  Delay(2000);
  connectWiFi();
}

Void loop() {

  Float temperature = dht.readTemperature();
  Float humidity    = dht.readHumidity();

  // Voltage reading
  Int rawVolt = analogRead(voltagePin);
  Float voltage = (rawVolt * 5.0 / 1023.0) * (230.0 / 5.0); // adjust based on divider

  // Current reading
  Int rawCurrent = analogRead(currentPin);
  Float current = (rawCurrent – 512) * (5.0 / 1023.0) / 0.185; // ACS712 5A model

  // Oil level
  Int oilValue = analogRead(oilPin);

  // Print locally
```

```
  Serial.print(“Temp: “); Serial.println(temperature);
  Serial.print(“Hum: “);  Serial.println(humidity);
  Serial.print(“Voltage: “); Serial.println(voltage);
  Serial.print(“Current: “); Serial.println(current);
  Serial.print(“Oil Level: “); Serial.println(oilValue);

  // Send to cloud
  sendToThingSpeak(temperature, humidity, voltage, current, oilValue);

  delay(15000);  // ThingSpeak minimum 15 sec
}

Void connectWiFi() {
  Serial.println(“AT”);
  Delay(1000);

  Serial.println(“AT+CWMODE=1”);
  Delay(1000);

  Serial.print(“AT+CWJAP=\””);
  Serial.print(WIFI_SSID);
  Serial.print(“\”,\””);
  Serial.print(WIFI_PASS);
  Serial.println(“\””);

  Delay(6000);
```

```
  Serial.println("WiFi Connected!");
}

Void sendToThingSpeak(float t, float h, float v, float c, int oil) {
  String data = "GET /update?api_key=" + API_KEY +
            "&field1=" + String(t) +
            "&field2=" + String(h) +
            "&field3=" + String(v) +
            "&field4=" + String(c) +
            "&field5=" + String(oil);

  Serial.println("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80");
  Delay(2000);

  Serial.print("AT+CIPSEND=");
  Serial.println(data.length() + 2);
  Delay(2000);

  Serial.println(data);
  Delay(2000);

  Serial.println("AT+CIPCLOSE");
}
```