



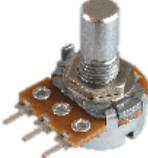




**Table 2.** IoT System Components

IoT Components	Specification	Description
 ESP32 Microcontrollers	Dual-core 32-bit MCU, 240MHz, 520KB SRAM, Wi-Fi/Bluetooth, 3.3V logic	Functions as the brain of the system that controls all components connected to the device.
 DHT22 Sensor	Temperature: -40°C to +80°C (±0.5°C) Humidity: 0-100% (±2-5%) Power: 3.3-6V (digital output)	Measures temperature and humidity of the air in the container that will be used as a place to cultivate BSF maggots.
 Load Cell + Modul HX711	5-10 kilograms range, 24-bit ADC, Powered by 5V	Functions to weigh the unit weight of organic waste.
 LED Lamp	Forward Voltage: ~2V, Current: 20mA, 220-330 $\Omega$ resistor used	Used as an indicator if the temperature or humidity of the BSF maggot cultivation container is not ideal.
 Potentiometer	10k $\Omega$ resistance, linear taper (B-type), operates at 3.3-5V, 3-pin (VCC, GND, and Vout)	Functions to regulate the ratio of BSF maggots to organic waste that has been collected.
 On-Off Switch	2-pin SPST, rated 250V AC / 6A, mechanical switch	Master power switch to start and stop the system.
 OLED Screen	Resolution: 16 chars x 2 lines, I2C Interface (SDA/SCL), VCC: 5V	Displays temperature, humidity, ratio (BSF maggots to weight organic waste), and weight of organic waste.