DESCRIPTION OF ALL COMPONENTS

1. **Arduino Uno** : The Arduino is a micro-controller board that is based on the ATmega328P, it consists of digital and analog input/output pins that are interfaced with the ultrasonic sensor (used to send and receive data). the Arduino Uno IDE consists of a Serial Monitor that displays the output.

2. **Ultrasonic Sensor(HCSR04)** : An ultrasonic sensor contains two circular structures: one is the transmitter and the other is a receiver. The transmitter transmits the ultrasonic sound while the receiver receives the reflected signal.

3. **TMP36 Temperature Sensor** : TMP36 temperature sensor is an analog temperature sensor with a wide temperature range. The left pin is for voltage input (2.7V to 5.5V) and, the pin on the right side is for the ground. The pin in the center is for the analog output.

4. **Gas Sensor** : The gas sensor is used to measure the concentration or presence of gas in the atmosphere. It is also used to detect smoke in the air. Based on the gas, a potential difference is generated by changing the resistance of the material present inside the sensor. The output is measure in terms of Voltage.

5. **Resistors** : Resistors are passive devices that restrict the flow of current or divide the voltage through the circuit. The input power passes through these resistors and then to the sensors to avoid damage.

6. **Breadboard** : The breadboard is the basic component of any circuit building process. All components, be it input sensors or output display devices are connected to the power supply, microcontroller using wired connections through a breadboard. The holes in the breadboard are in series. There are various sizes like full-sized, half-sized, and mini breadboard.

7. **LED** : Light Emitting Diode is a commonly used light source. It is a semiconductor that emits light when current flows through it.

8. **Piezo Buzzer** : It is an electrical component that generates a beep sound on receiving an input. It works on the principle of piezo crystal.

9. **Jumper Wire** : These are the main components that are used to establish the connections between different devices of the circuit.

10. **LDR (Light Dependent Resistor)** : LDR is a photoresistor that works on the principle of photoconductivity. The surface of the LDR is made with a layer of semiconducting material that is responsible for measuring the light intensity. The principle states that when light falls on the surface of the semiconducting material, the electrons receive energy, and movement is caused inside the material.

11. **4x4 Keypad** : A 4x4 matrix is used to insert input values into the project. This particular component has a total of 8 terminals, driven out from the 16 buttons present in the module.

12. **IR Remote** : IR (InfraRed) remotes are a handheld wireless device to operate other electronic devices. #IR remotes act as a transmitter that carries signals from remote to the devices it controls. It emits lights in an infrared range that corresponds to specific commands, such as power on, volume up, etc. The controlled device acts as a receiver. It decodes the infrared pulses of light and executes the command.

13. **IR Sensor** : IR (InfraRed) Sensors refers to an electronic device that measures and detects Infrared Radiations.

14. **16x2 LCD** : LCD- Liquid Crystal Display is an electronic module that uses liquid crystal to produce a visible image. It is the basic module that is generally used in DIY's and circuits. The display segments are affordable and simply programmable.

15. **Pushbutton Switch** : Pushbutton switches are mechanical devices that make or break an electrical connection by the closing or opening electrical contacts or solid state circuitry when actuated by human or mechanical interaction.

16. **Potentiometer** : A potentiometer (often shortened as pot) is a variable resistor with three terminals: two connected to a resistive element and one connected to a wiper (adjustable contact). It allows you to vary the resistance manually by rotating or sliding it.

17. **Power Supply** : A power supply is an electrical device or system that provides electrical energy to a load (such as a circuit, sensor, or Arduino). It converts electrical power from a source (like a wall socket or battery) into the correct voltage, current, and frequency needed by the device.

18. **Neopixel Strip** : It is a strip of RGB LEDs with built-in IC that make it programmable. The Neopixel LED consists of 3 pins:

- **Ground**: This pin is connected to the ground of the circuit.
- **Data(DIN)**: This is the Data in the pin which is provided with the PWM signal.
- **5V:** This powers the LED with 5V

19. **Servo Motor** : A servo motor is a small motor used for precise angle control, typically between 0° and 180°. It receives signals through a PWM pin and adjusts its position accordingly. Commonly used in robotics, RC vehicles, and Arduino projects.

20. **Passive Infrared Sensor(PIR)** : PIR sensor detects and measures the infrared radiation emitting from the objects present in its range of application. PIRsensor is commonly used in motion detection applications.

21. **RGB LED** : In RGB LEDs, the three primary colours Red, Green, and Blue are added together in different combinations to get different arrays of colours.

22. **Attiny85** : Attiny85 is a microcontroller board that supports Arduino IDE and can be used in microcontroller-based projects. It is a RISC-based microcontroller and has eight pins. Attiny85 is cheaper and more compatible than the Arduino Uno board.

23. **1.5V Battery** : An alkaline battery of 1.5V is used in this project as the power source.

24. **Photodiode** : A photodiode is a light-sensitive semiconductor device that converts light into electrical current. It is commonly used in light detection systems, such as in solar sensors, smoke detectors, and optical communication. The current produced is proportional to the intensity of the light received.

25. **DIP Switch DPST** : A DPST DIP switch is a manual switch with two poles that control two separate circuits simultaneously. It's commonly used to configure electronic devices or set modes in embedded systems.