Components of the Proposed System

The researchers’ components of the proposed system are Arduino uno r3 for microcontroller board. AC relay module kit with outlet plug and wire for Arduino control of 220v AC load, 10 ohms and 100 ohms resistors, passive infrared sensor, a Grove LED display 16x2 IC2, GSM module, sim900 GPRS shield, wire, 5v power supply and Firefly Yellow Shield Antivirus and Germicidal UV Tube Set.

Arduino Uno R3 is a 14 input/output pinned microcontroller which has a 16-Megahertz ceramic resonator, USB connection, a power jack, an ICSP header and a reset button. This is a microcontroller that can be programmed and as such, can be the only microcontroller you will ever need in creating complicated systems.

Arduino Uno can only handle up to 5 volts and can malfunction when applied at a higher voltage, much more when using 220 AC volts into it. The AC Relay module kit helps the microcontroller to handle up to said voltage that is in the description of the module. In the module used in the project, the researchers specifically used a 220v AC load.

Resistors are static components that help regulate the current running in a circuit. The higher the resistance(ohms), the lesser the current(amp). In the project, the researchers specifically used 10 ohms and 100 ohms values of resistors.

Passive Infrared Sensors or PIR Sensors is used to detect an object that is in front of it and act as a switch to a circuit. It activates the circuit when the object is detected by the infrared. This is commonly used in automatically triggered lighting devices and protection systems. In the project, the researchers used it as a detector for the object or item placed inside the chamber to automatically start the disinfection process.

LED Displays are displays that are commercially used in the market because of their efficiency and low-energy consumption. These displays are made up of a series of LED panels which contain LEDs that can be used in a variety of ways from providing light to sending a message. The researchers used a Grove, 16x2 LED display which can be programmed with the use of Arduino Uno and is used to display the status of the disinfection process.

GSM (Global System for Mobile Communications) Module is a chip that can be used to provide the option to send SMS (short messages service) messages in a system. This chip has an antenna to receive and send out transmissions and a slot for the sim card which will be used to send out messages to other devices. The sim900 GPRS shield is the specific model used by the researchers. Despite the small size of the model, this packs many features and is one of the latest models.

The circuit created by the researchers is connected by copper wires. Copper wires are most commonly used in circuits for its conductivity and these wires are covered by rubber for insulation.

Power supplies are components that supply power to at least one load. This is used to provide and regulate a consistent value of current to a load to avoid any inconsistency to the load that can cause complications and malfunctions for the load. The researchers used specifically a 5v power supply that is used to supply power to the Arduino Uno.

UV lights are lights that are capable of disinfecting surfaces within a prolonged period of time under a specific range of intensities. The researchers used Firefly Yellow Shield Antivirus and Germicidal UV Tube Set which has an intensity of 254 nm, operates at a 230 V at 60 Hz, and covers the range of 15 to 20 square meters.

<https://docs.arduino.cc/hardware/uno-rev3/>

<https://lastminuteengineers.com/one-channel-relay-module-arduino-tutorial/>

<https://learn.sparkfun.com/tutorials/resistors/all>

<https://www.sciencedirect.com/topics/computer-science/passive-infrared-sensor>

<https://www.techopedia.com/definition/14957/led-display#:~:text=LED%20Display%20(light%2Demitting%20diode,the%20user%20and%20the%20system>.

<https://www.electronicsforu.com/resources/gsm-module>

<https://lastminuteengineers.com/sim900-gsm-shield-arduino-tutorial/>

<https://www.sciencedirect.com/topics/engineering/copper-wire>

<https://www.techopedia.com/definition/1756/power-supply#:~:text=A%20power%20supply%20is%20a,provides%20components%20with%20electric%20power>.