

SMART MULTIPLUG

Abstract –

We believe that most commonly used in Sri Lanka is the standard multi-plug. Also, a multi-plug is usually used in every home.

Often these are multi-plug outdated traditional devices in use. Some of these devices cause power outages and accidents. One of the most important issues we consider when it comes to safety is the safety of kids. This is because home appliances are often connected to a multi-plug, which can cause electric shocks to children passing by. Based on this problem, we propose to create a smart multi-plug that takes into account the safety of the electrical appliances in the home. In addition, it can be connected to any smartphone, making everyday activities easier. So we believe this new multi-plug will be a better device than the ones currently on the market.



power outages , electrical accidents , spraks flying and Burning multi-plug

Introduction –

In our daily life we use various electrical appliances for various purposes. A wall socket is usually used to supply electricity to these electrical appliances. Generally, the limited number of wall sockets available in a house or any building is not enough, so we are used to using multi plug. A multi plug is a device that has multiple sockets. Although there are a variety of multi plugs in the market, most of them are conventional devices with less protection.

Keeping these facts in mind we have designed a multi plug with updated safety and IOT technology. Often people are busy and waste electricity. For example, after using an electrical device that requires a high-power supply, forgetting to turn it off and having to go near the device to do so, this type of electricity wastage is common. This multi plug that we have introduced can control any socket within a certain limit.

The specialty of this multi plug is that all the sockets are controlled by a mobile application. Also, the sensor here will sound an alarm when a small child comes near this device. This can be changed as per the user's requirement. Due to this, electrical accidents can be prevented for small children. There are no physically buttons to enable and disable sockets and only one button is used to enable the entire system.



Electrical accidents can be prevented for small children

Aim -

The Main aim is to design a smart home device by taking the safety of small kids. Where household with little children into consideration and to control it remotely as well.

Problem Statement-

Considering the problems like excessive wastage of electricity, electric sockets caused by the unconsciousness of small kids, not being able to control oneself properly while being away, we focused on carrying out this project.

Implementation (Method) –



For this project we were think to use Proteus software for designing and simulating electronic designs. Also we think to use Arduino IDE software to upload code.

A current of 230 v is supplied to the AC to DC power converter and the two sockets.

The supplied 230V power is converted to 12V by the 300mA transformer in the power converter. The 12 V AC power from this is converted into 12 V DC current by the bridge rectifier in the circuit. Four 1n 4007 diodes are used for this bridge rectifier. Then the resulting 12v DC current is smoothed by a 1000 mF smoothing capacitor and converted to 5 v DC current by the 7805 voltage regulator. This 5V power supply is provided for relays, NodeMCU board, Ultrasonic sensor and USB port.

Here a 4 Channel relay module is made using four 5V Relays. Also, a BC547 NPN transistor is used as a switch to provide the required voltage to the relay. Each relay can be turned on/off via an LED bulb. A 330 ohm resistor is used between the base of the transistor and the cathode of the lead bulb to protect the transistor and the lead bulb. In addition, 1N4007 diode is used on both sides of the relay coil. The collector of the transistor is connected to the anode of the diode and the emitter is grounded. The 13A Sockets, USB port and Ultrasonic sensor to be changed in the Multi plug are connected to these relays respectively.

Here hc sr04 ultrasonic sensor and buzzer are used. Here, when someone gets closer than twenty centimeters, the ultrasonic sensor sends a signal to the buzzer via the nodemcu. Then the buzzer will sound. This ultrasonic sensor is designed to operate only when needed.

To do this project we used nodemcu board which includes ESP 8266 microcontroller. We chose this nodemcu because it can work through wifi technology.

In this case, we have hosted a web page on our nodemcu. We go to the web browser from any device in the local area and enter the local IP address of our nodemcu and load the web page. After that, the nodemcu's GPIO pins can be controlled with its buttons.

Hardware Components –

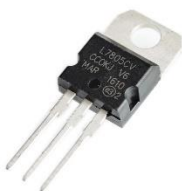
NodeMCU ESP8266



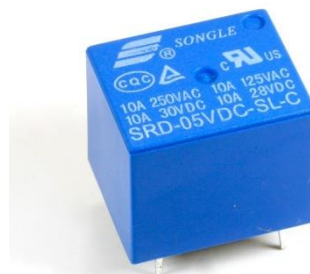
12V Full wave Transformer copper



7805 IC



5V relay



BC547 Transistor