**DESIGN AND CONSTRUCTION OF A MULTI-FUNCTION CONTROL SYSTEM FOR A SMART WINDOW**

**[USER MANUAL]**

PRESENTED TO COVENANT UNIVERSITY LABORATORY, IN PARTIAL FUFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE BACHELOR OF ENGINEERING DEGREE, ELECTRICAL AND ELECTRONICS ENGINEERING.

BY

ADETULA OLUWATOBI

17CK022556

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**Working Principle**

The system is composed of the following:

1. Power Supply Unit:
   1. 5V Power Supply Unit
2. Control Unit
   1. ATMEGA Microcontroller
3. Sensor Unit
   1. Gas Sensor (MQ2 and MQ9)
   2. Rain Sensor
   3. DHT11(Temperature and Humidity Sensor)
4. Output Unit
   1. LCD Display (16X2)
   2. I2C LCD Adapter
   3. Servo Motor’s (sg90)

When the system is powered on using the power supply, the microcontroller initializes the LCD, Sensors and Motors. The Sensors start to take reading. The DHT has an internal ADC, it is the only sensor connected to digital input.

The IR receiver is used to receive input from the IR Remote to control the device. It can be set to any of the following modes based on a corresponding button press:

* Button **CH :** Function List, for determining button Press list
* Button **CH+ :** RGB Colour Test Mode
* Button **Play:** Window Fully Open
* Button **EQ:** Window Closes Fully
* Button **Vol-:** Window Closes in increments of 10
* Button **Vol+:** Window Opens in increments of 10
* Button **3:** Buzzer Test Mode.
* Button **4:** Smoke Sensor Mode.
* Button **5:** Flammable Gas SensorMode.
* Button **6:** Rain Sensor Mode.
* Button **7:** Temperature Sensor Mode.
* Button **8:** Humidity Sensor Mode.
* Button **9:** System Reset Remote Reset.

**Modes Explained**

* RGB Colour Test Mode: This

**Operation Procedure**

1. Turn on the device by plugging in.
2. Wait for the system to initialize
3. Remote can be used to control the window
4. Check RGB Led for errors
5. Confirm that Sensors are reading correctly
6. **Simulate test with remote**