### DEVELOPMENT OF AN AUTOMATED IRRIGATION SYSTEM FOR GRAIN CROP FARMLANDS IN NIGERIA USING SOLAR POWER.

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.

COMPILED BY: ADELEYE TIRENIOLUWA,  
16CK020775

26TH JULY 2021.

### Working Principle

The system comprises of a power system, a sensor system and an output system.

The sensor module is connected to the Arduino. It then produces an output voltage according to the resistance of the probe in the soil and is made available at an Analog output (AO) pin. The same signal is fed to the LM393 High Precision Comparator to digitize it and is made available at Digital output (D0) pin.

The output of the sensor (Digital Output D0 of the module) is connected to Digital pin2 (D2) of the Arduino nano, if the soil is humid, this output will go low and if humidity level is very low the output will go high.

The Arduino constantly checks the input from the pin D2 and if High, it will make pin9 (D9) and pin12 (D12) go high which energies the relay to turn ON the pump and LED-GREEN. If the input from pin2 (D2) is low, it will make pin9 (D9) and pin12 (D12) go low and turn OFF the pump, while pin11 (D11) will go high and ON the LED-RED.

The LCD is connected to the Arduino Nano through a 12C LCD interface connected to the SDA and SCL pins which corresponds to pin A4 and A5 on the Arduino Nano respectively.

The red LED is connected to pin D11 while the green LED is connected to pin D12. The relay output is connected to pin D9 through the UNL2003 relay driver.

One end of the live wire of the 220V AC supply is connected to the spindle of the relay, while the other end is connected to the normally closed of the relay.

The system comprises of a battery/inverter system the inverter receives a 12v input voltage from a dc battery. A switch is turned on by a 220v power supply output from the inverter which runs the system .