LORA BASED AUTOMATIC GREEN HOUSE

AIM:

Design and Development of LoRa based automatic green house.

PURPOSE:

Green house is a physical structure with glass or transparent material that can provide proper environment to cultivate plants and flowers. To provide proper environment, we have to read some parameters of environment and maintain each parameter threshold values. Based on plant type environmental parameter values will vary. Using Arduino Microcontroller we want to design Greenhouse automation system. Using LoRa interface we will upload data to LoRa(Sx1278) gateway and from that data will be uploading to IOT cloud server. Proposed project title is LoRa(Sx1278) based automatic greenhouse automation using Arduino and ESP32 nodemcu.

DESCRIPTION:

This project consists of Arduino and ESP32 Nodemcu microcontrollers. Green house section consists of Arduino, LoRa (Sx1278) module and sensors like DHT11, LDR, and Rain sensor. All these sensors connected to Arduino digital pins and LoRa (Sx1278) module to SPI port. Sensors act as inputs of entire system. Rooftop slider (DC-drive), Light and Fan act as outputs and controlled by relays. Gateway section consists of EP32 Nodemcu and LoRa (Sx1278) module

WORKING:

Arduino section reads few parameters of environment like temperature and humidity with DHT11, Rain status with Rain sensor, Light status with LDR. When temperature level rises than desired level then Fan will be ON otherwise OFF. If Light fails then light will be ON. When rain comes then rooftop will be closed. Arduino powered by 12vDC battery which is charged through Solar panel. All these

sensors data will be displayed on 16x2 LCD display Also transmitted to LoRa module. Receiver LoRa module receives data and upload to Cloud sensor through its inbuilt WIFI connection.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontrollers	:	Arduino Uno and ESP32 Nodemcu
Crystal	:	16 MHz
LCD	:	16X2 LCD
LoRa Module	:	SX1278
Temperature Sensor	:	DHT11
Humidity Sensor	:	DHT11
Light Sensor	:	LDR
Rain Sensor	:	Resistive Type
H-Bridge	:	L293D
Roof Top	:	DC Drive with Open and Close Mechanism
Fan	:	12V DC
Relay	:	12V DC
Light	:	230V AC
Power Source	:	12VDC adaptor, 12V DC Battery and Solar Panel

SOFTWARE:

Arduino IDE

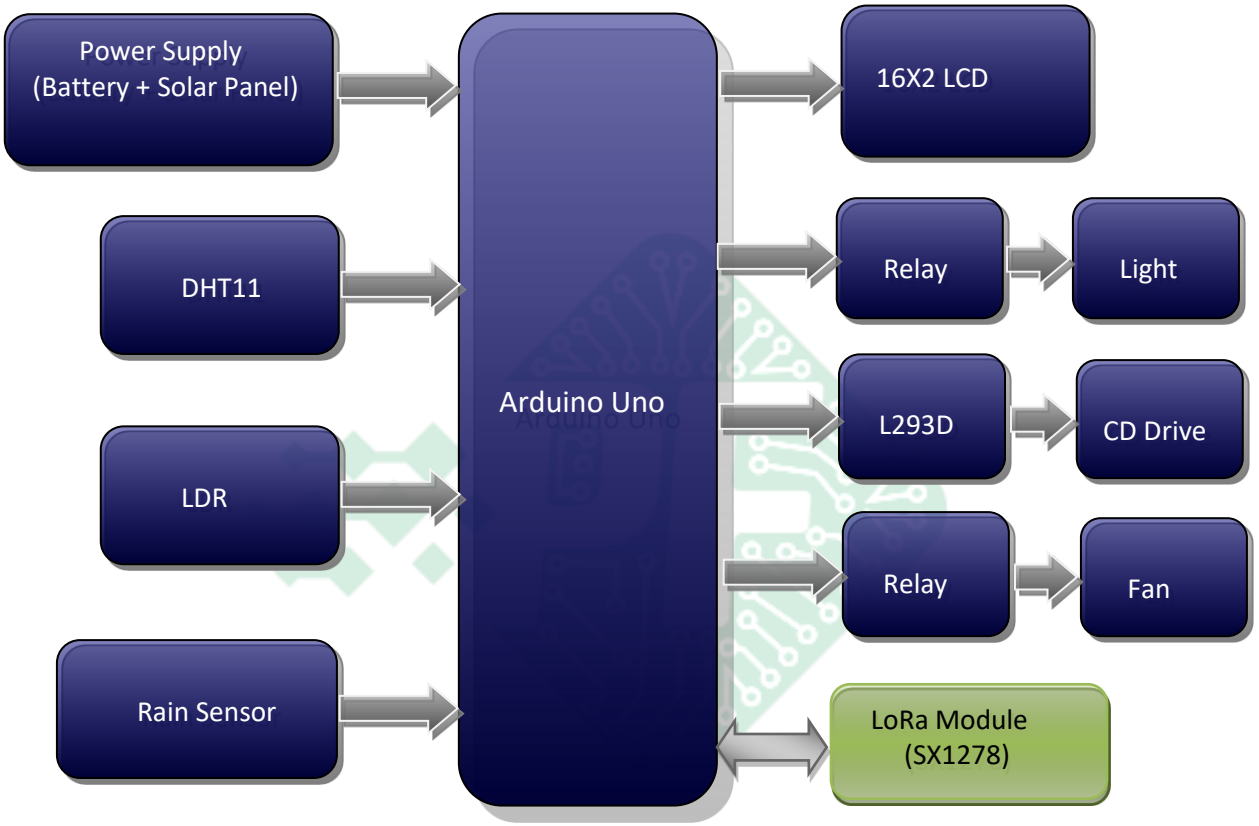
Proteus based circuit diagram

APPLICATIONS:

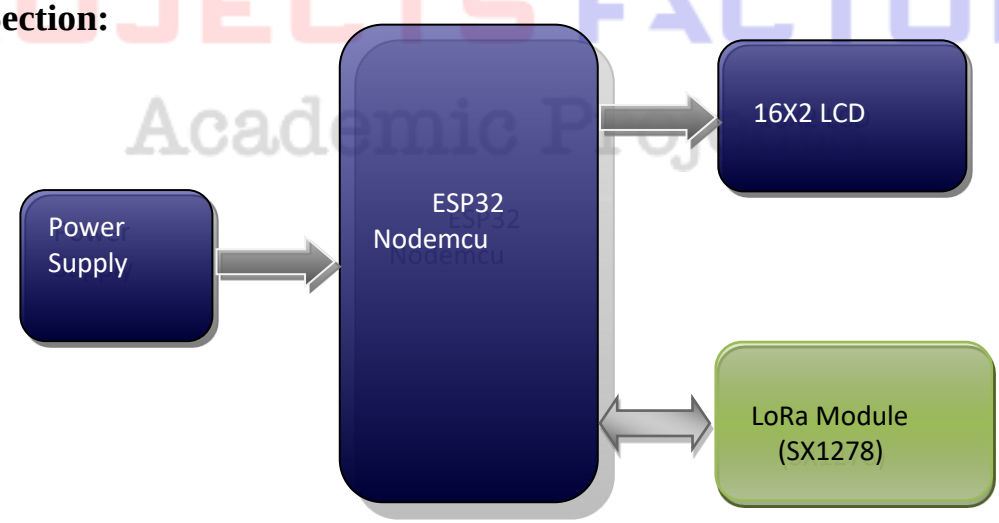
- Green House Monitoring and Controlling
- Weather Monitoring Applications
- LoRa based Datalogger

BLOCK DIAGRAM:

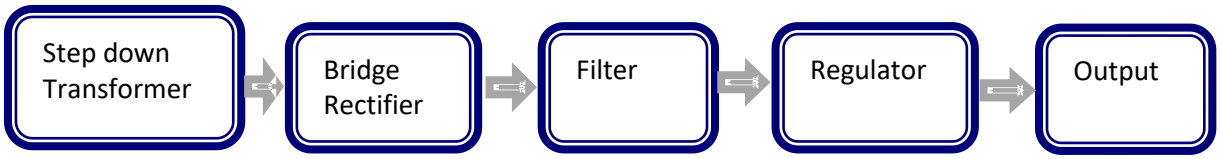
Transmitter Section:



Receiver Section:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERD:

- We have covered LoRa module interface
- Sensors like Rain Sensor, LDR Sensor, DHT11 sensors
- Solar Panel and Battery interface