

LORA BASED GPS TRACKER

AIM:

Design and Development of LoRa based GPS tracker.

PURPOSE:

Tracking applications are widely used in everywhere. Daily applications like cab services, vehicle tracking, human tracking, asset tracking and public transport tracking. But all kind of vehicle tracking system are GSM based and need SIM card. Some blind spots restricted GSM signals where there is no signal coverage. Few applications like food delivery or local transport kind of systems are within the city. This kind of local tracking systems doesn't require on board SIM cards. We can create LoRa WAN that can take data and pushing into internet. In LoRa WAN application, each user have LoRa transmitter module along with GPS module. Some LoRa receiver placed around the city or local area, each LoRa receiver (LoRa Gateway) can cover 1-40Km Radius. Even very big cities like metros need in very few like 20 LoRa Gateway devices. The proposed project title is LoRa based GPS tracker. This kind of systems are very less expensive when comparing with traditional GPS trackers.

DESCRIPTION:

There are two parts in this project. Transmitter part contains Arduino, GPS module, LoRa (Sx1278), LCD and button. Receiver Part contains ESP32 nodemcu and LoRa (Sx1278) receiver.

WORKING:

Tracking vehicle or user has transmitter part. When user press button, then GPS values will transmit to LoRa (Sx1278) receiver. Receiver side ESP32 nodemcu handle GPS data and transmit to IOT server which can show GPS values on Google maps. Here ESP32, LoRa section worked like WAN or gateway. LoRa gateway always communicates with internet. It is in fixed place and can be connected with multiple LoRa transmitters. From IOT server we can monitor user location on Google maps.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontrollers	:	Arduino Uno and ESP32 Nodemcu
Crystal	:	16 MHz
LCD	:	16X2 LCD
LoRa Module	:	SX1278
GPS module	:	NEO model with UART communication
Power Source	:	12v 1 amp DC Adaptor and Battery

SOFTWARE:

Arduino IDE
Proteus based circuit diagram

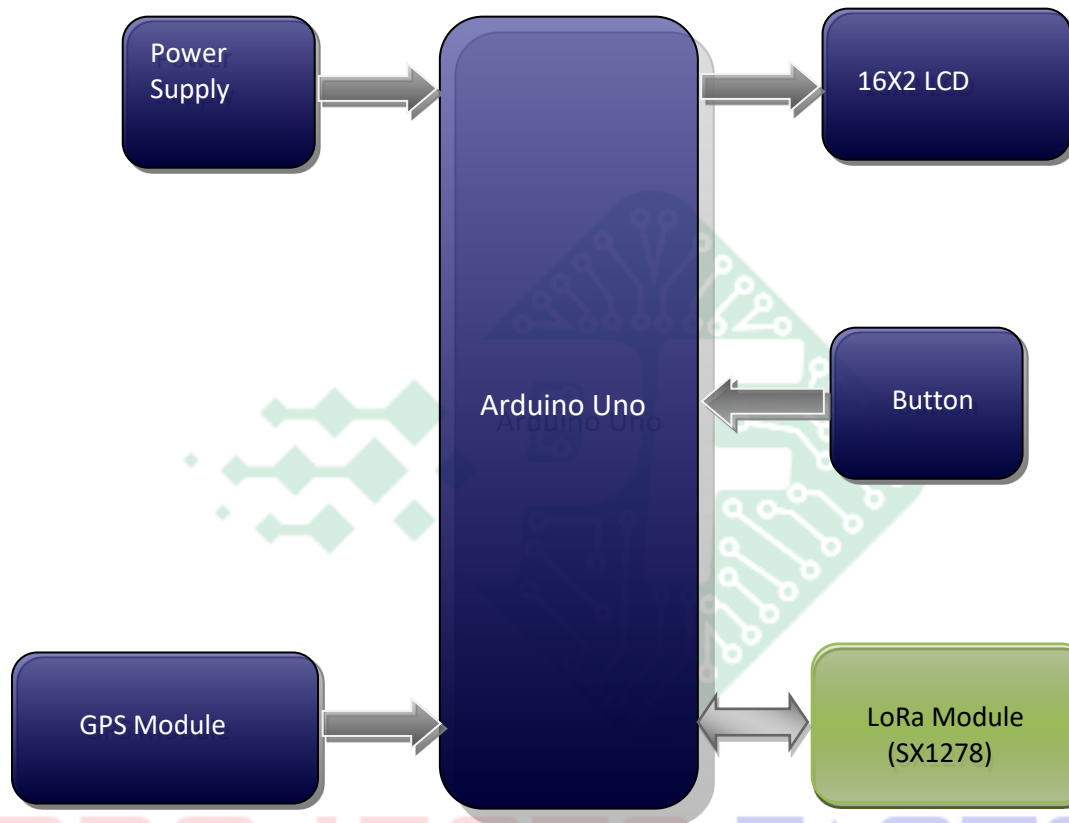
APPLICATIONS:

- Tracking Applications
- Local tracking
- LoRa Gate way applications

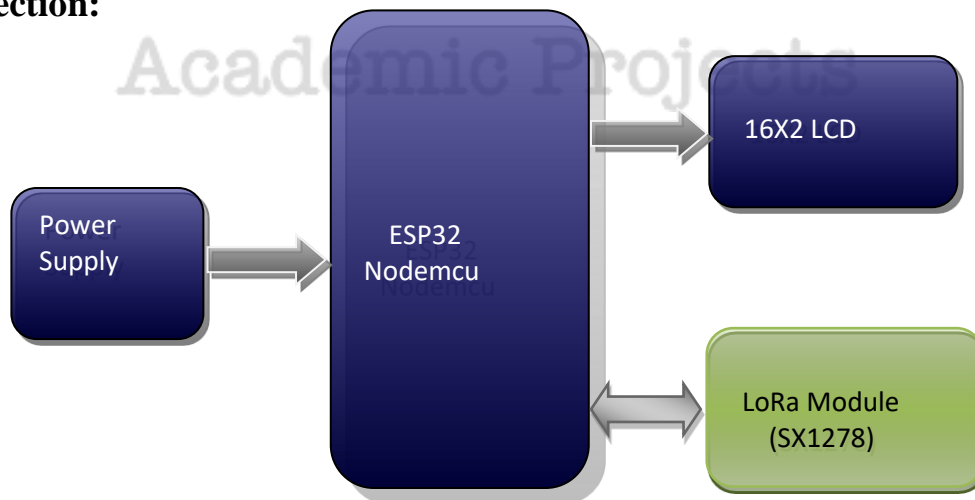
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BLOCK DIAGRAM:

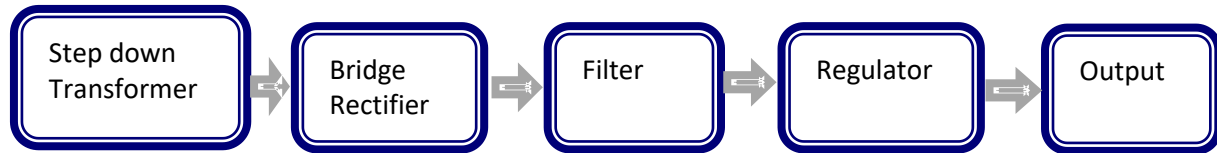
Transmitter Section:



Receiver Section:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERED:

- We have covered LoRa module interface
- Arduino and ESP32 nodemcu
- GPS module interface



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