

» GROUP PROJECT - 1

DRONE AUTHENTICATION SYSTEM

Project By :

DHYANAM PANDYA - 19EC035
AKSHAT PATEL - 19EC037
ISHAN SINGH - 19EC072

Contents

- Abstract
- Why this Project
- Block Diagram
- Components used
- Working of the project
- Hardware Implementation
- Applications
- Learning Outcomes
- Future Enhancements
- References

» DRONE AUTHENTICATION SYSTEM

ABSTRACT:

Recently, we have undergone several drone attacks in the northern part of our country where we share our boundary with Pakistan. The INDIAN AIR FORCE STATION, JAMMU was attacked with several unidentified explosive-laden drones. Citing this as a major security issue, we decided to tinker on a possible security solution for creating a "Drone Authentication System" in which in order to use the drone, the drone pilot first needs to request access which would be communicated via the GSM module. Only if the access is granted, the pilot would be allowed to fly the drone. Apart from that, we have to set up a "Drone Authentication & Tracking Center" where the sole purpose of this center would be to overlook all the requests submitted by the drone pilots, rather give or deny access and track those who are currently in their flight. While at the same time make sure that all the safety protocols are being followed appropriately.



WHY THIS PROJECT ?

- Importance of Drones in todays day and age .
 - A feasible solution for the recent technological developments in the field of logistics and surveillance .
 - Talking about surveillance as there are PROS of this innovation so are the cons , which we recently saw several drone attacks in the Northern Part of our country .
 - The INDIAN AIR FORCE STATION, JAMMU was attacked by several unidentified explosive laden commercial drones .
 - Which comes out as a major security concern for the nation.
 - Leading to a simple solution , of banning any activity of drones . Hence we in our project propose something different , which allows only those drones with an access to fly in that particular area .
-

COMPONENTS UTILIZED:



GPS MODULE



ARDUINO NANO BOARD



SINGLE CHANNEL RELAY MODULE



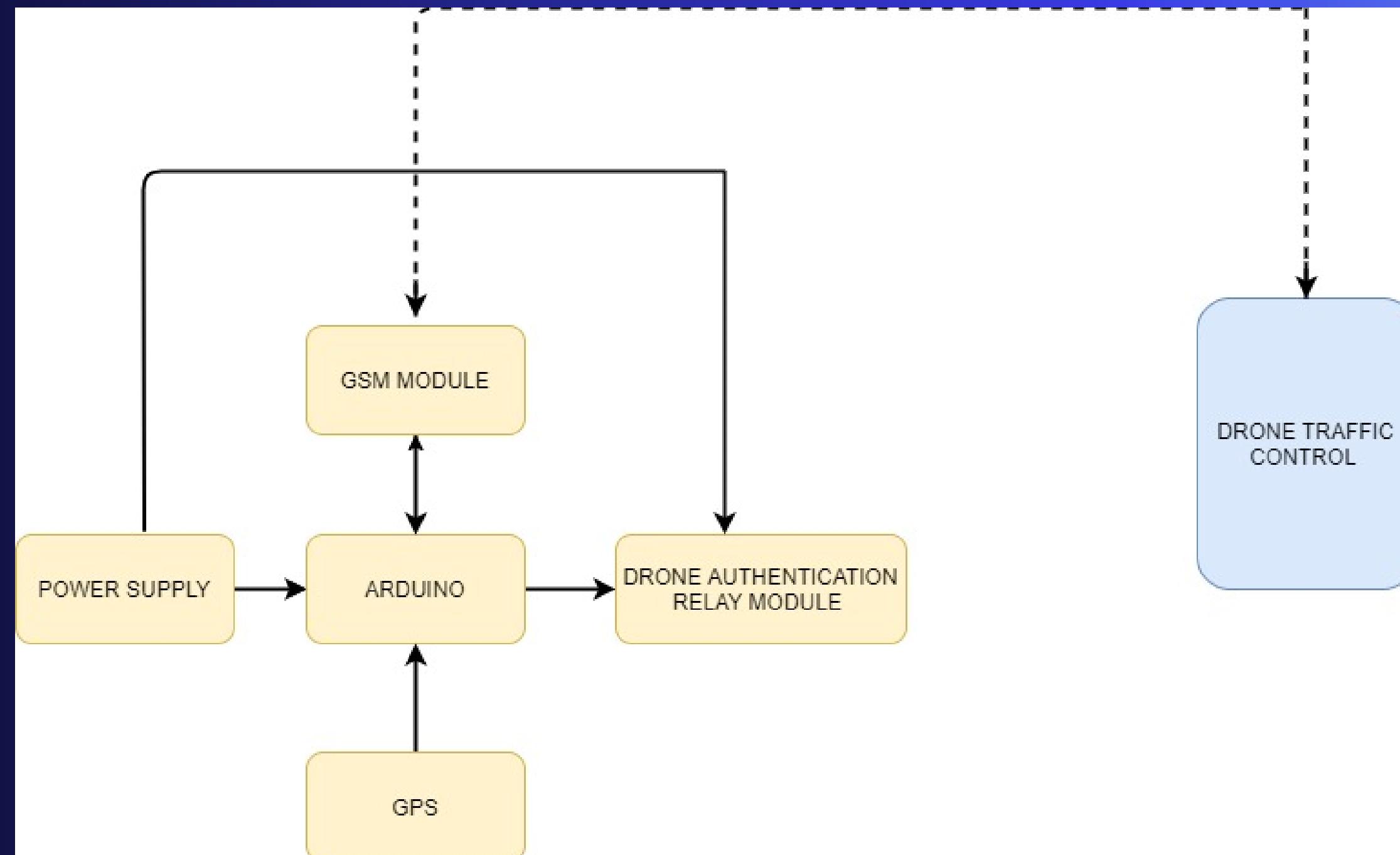
Li-Po Battery



GSM MODULE



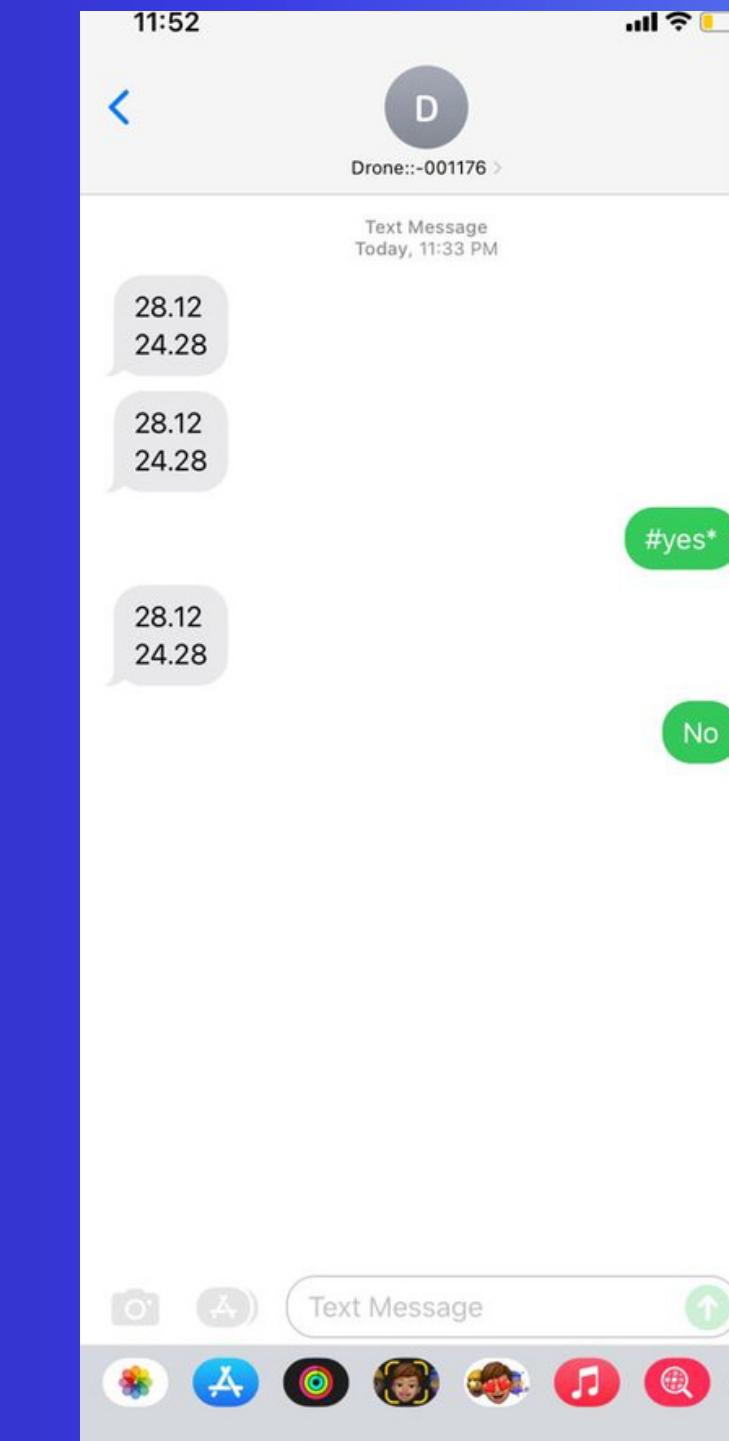
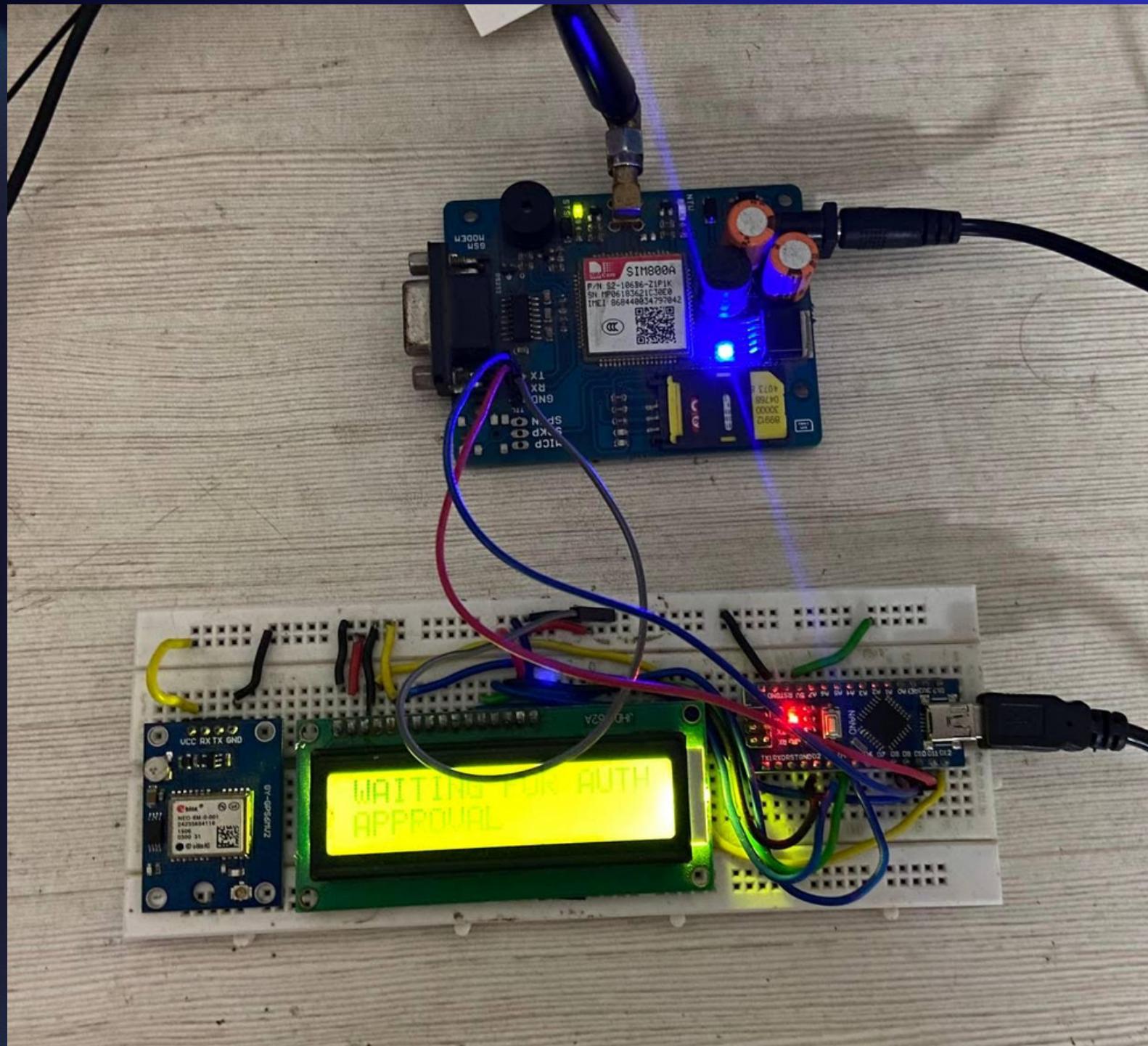
BLOCK DIAGRAM



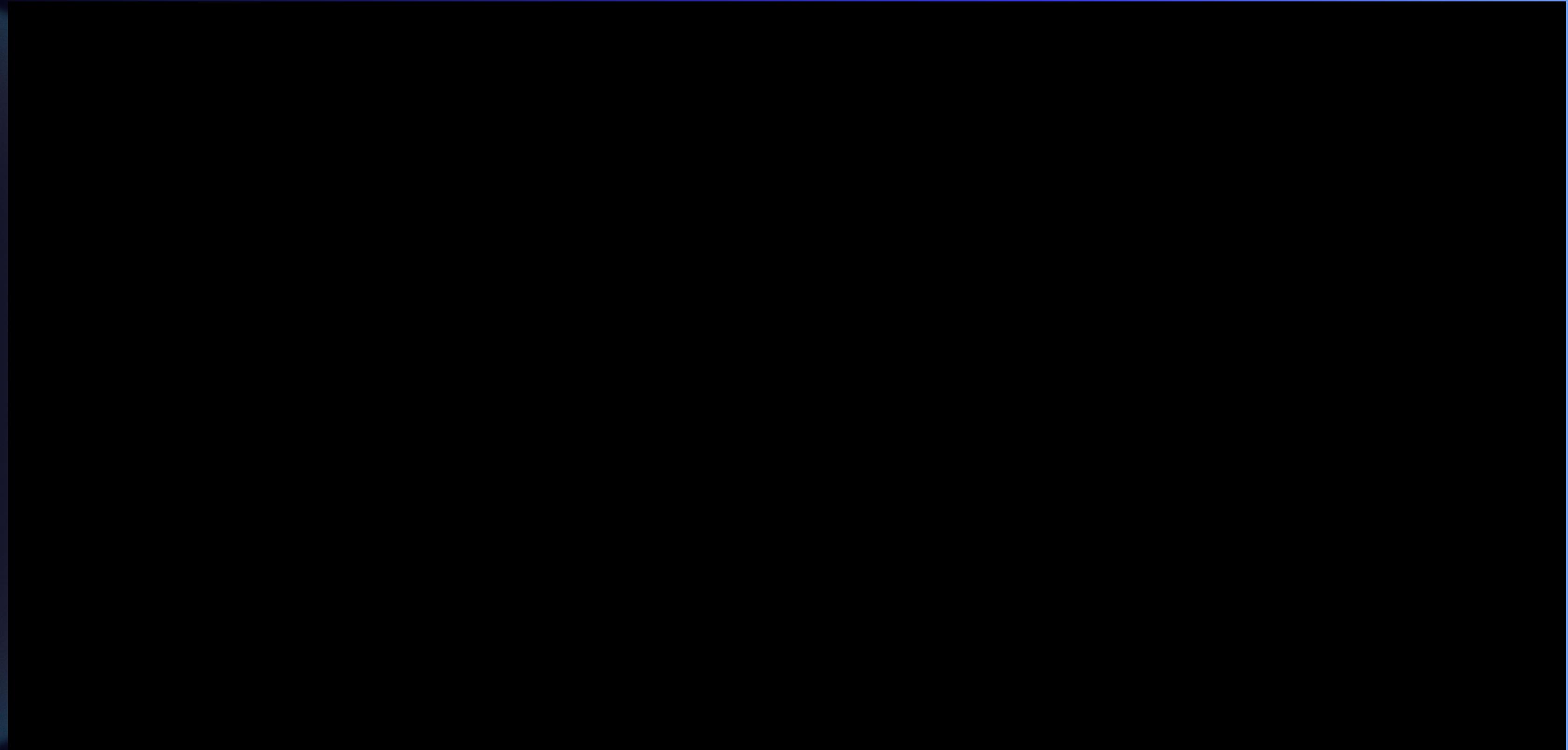
WORKING OF THE PROJECT :

- When system is Initialized , simultaneously GPS module will start fetching the values .
- The fetched values will be further referred with the Pre-specified Restricted Zones .
- If the drone is requesting to take a flight in the Restricted Zone it would Deny the Access.
- While in zones except the Restriction bound , the co-ordinates and the drone credentials with the Pilot credentials is sent to the DRONE AUTHENTICATION CENTER (DAC) .
- The DAC will check for any possible hinderance in the Air Traffic and will confirm that the request fulfills the pre-requisites.
- If fulfilled , The DAC will send "YES ". Hence confirming the Permission to Fly the drone.
- If in the case , when a drone enters Restricted Zone , this system would immideatly shut off the power supply to the drone .

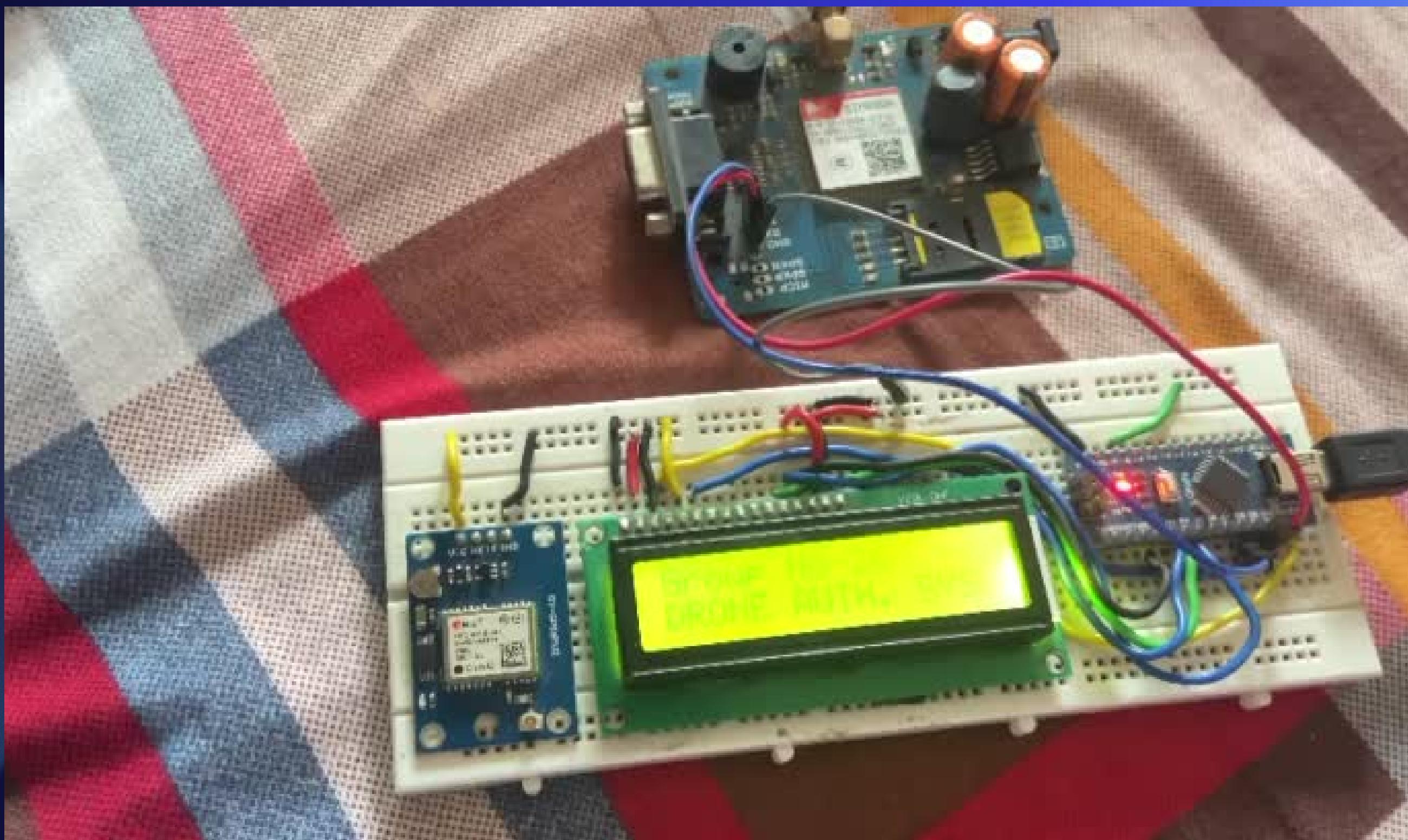
HARDWARE IMPLEMENTATION:



HARDWARE IMPLEMENTATION:



HARDWARE IMPLEMENTATION:



APPLICATIONS:

- The application of the drone authentication system is limited to only one but it's a very crucial one in current times citing the fastly growing popularity of the drones. This application being the authentication of drone for a certain area that are pre-specified restricted zone. This authentication process will give a great control over the drone traffic in that pre-specified restricted zone which thereby increases the security of these zones.

LEARNING OUTCOME:

- This project started as a raw idea that came during a brainstorming session, which we were able to successfully fabricate to hardware. But along with this we faced challenges related to coding and interfacing the antenna. It was our first time working on GPS module, GSM module and Arduino NANO, so it was very interesting to know about them. Hence by going through the several datasheets of the components we were able to figure out how things work together. From which we were able to code the program for this project. At the end we were able to put all this together and also learn how to work with gps gsm in a bidirectional communication.

FUTURE ENHANCEMENTS:

- Authentication centre will be able to power off whole drone system if required.
- Warning/Alert message will be sent to Drone pilot while approaching RED ZONE.
- GPS tracking of Drone via Mobile Application.
- Scaledown the size of the project to make it more compact and fittable on the drone.

REFERENCES:

- www.arduino.cc
- components101.com
- www.datasheetspdf.com
- researchdesignlab.com
- en.m.wikipedia.org

**THANK
YOU!**