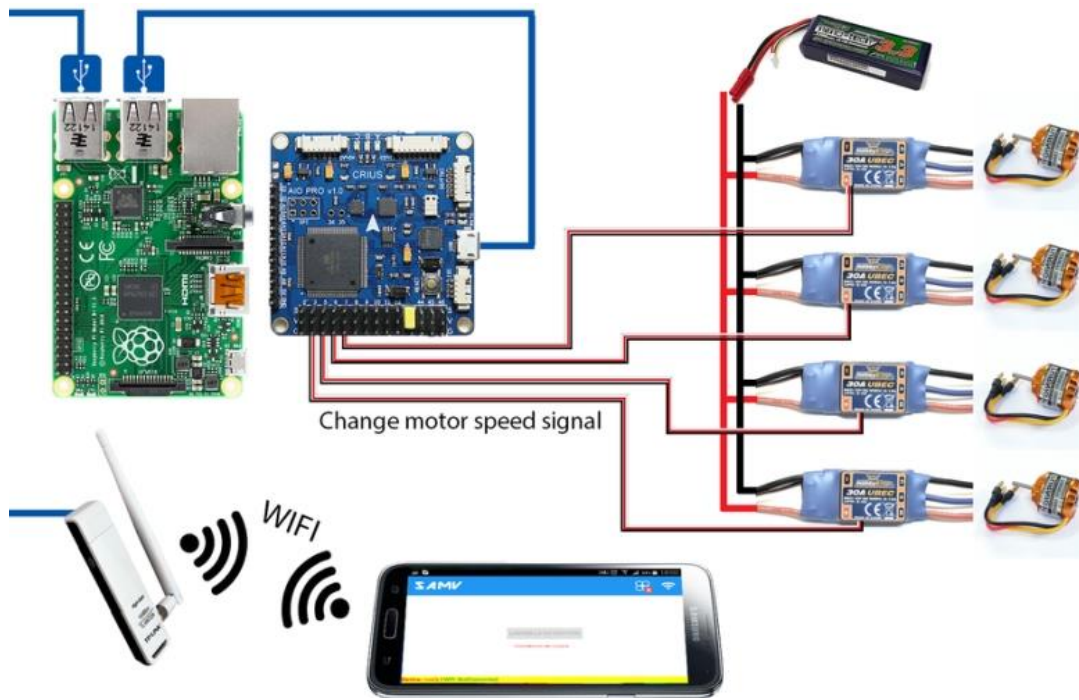# SIGMA

RASPBERRY MICROCONTROLLER DRONE
MODEL-DRONE100

This Drone trainer kit has been designed with a view to provide practical and experimental knowledge to make a Drone using Raspberry Micro Controller.

SPECIFICATIONS

Hardware

Connections

Mission Planer – ArduPilot - Software

Radio Transmitter and Fs Ia6 Receiver

1. Drone Hardware

1. Raspberry Micro Controller : Pi 4 Model B
2. NAVIO Kit : with Power module, wires and GPS
3. ESCs : 4 Nos
4. Motors : 4 Nos
5. Frame : 1 No
6. Propeller : 4 Nos
7. Battery : 1 No.
8. Battery Charger : 1 No
9. Telemetry Transmitter Receiver : 1 No
10. LiPo Fire-proof Case : 1 No
11. PPM Encoder : 1 No
12. Micro SD Card : 32 GB
13. Micro SD to USB Reader : 1 No
14. Battery Connector : 4 Nos
15. GPS Mount : 1 No
16. Velcro Straps : 1 No
17. Scotch Mounting Tape : 1 No
18. Zip Ties : 10 Nos
19. Allen Wrench : 1 No
20. Electrical Tape : 1 No
21. Flight Controller - RC Controller : 1 No

2. Software:

1. Python 3.11
2. ArduPilot

3. Accessories:

1. Pen Derive with Software, Library, Driver,
    Codes, Soft Copy of Manual and Mobile App   : 16 GB
2. Printed Practical Manual   : 1 No.
3. E-Books for IOT Subject   : 10 Nos. in PDF Format
4. Mp4 Video Class for Drone   : 40 Nos

4. Cabinet and PCB

The complete circuit diagram is screen printed on component side of the PCB with circuit and Parts at the same place. The PCB with components on front side is fitted in elegant wooden box having lock and key arrangement. The acrylic cover is fitted on PCB to safeguard parts. It works on 230 V AC Supply.

EXPERIMENTS

A. Theory Experiments

1. To understand theory and working of Drone
2. To understand theory and working of Block Diagram of Drone System
3. To understand theory and working of Raspberry Micro Controller
4. To understand theory and working of Flight Controller
5. To understand theory and working of Electronic Speed Controller – ESC
6. To understand theory and working of Distribution board
7. To understand theory and working of Battery used in Drone System
8. To understand theory and working of Propeller
9. To understand theory and working of Motors used in Drone system
10. To understand Software used for Drone System
11. To understand theory and working of Remote Controller - RC

B. Drone Assembly Experiments

1. To solder the bullet connectors onto the ESCs
2. To solder ESCs to the distribution board and soldering battery connector to board
3. To attach Drone arms to bottom plate
4. To install motors onto the frame
5. To install RC Controller onto Raspberry Pi and install them onto the top plate
6. To install top plate to the Drone
7. To fix ESCs to frame securely
8. To bind Controller / Transceiver / Transmitter with the Receiver
9. To calibrate the ESCs
10. To check motors spin direction
11. To attach PPM encoder and RC receiver to the Drone
12. To connect ESCs to the RC Controller
13. To attach and connect Telemetry Transmitter Receiver Module to the Drone
14. To attach Power module to Drone
15. To attach landing gear
16. To build GPS mount and attach GPS Antenna onto it
17. To protect the barometer from UV radiation
18. To attach Propellers
19. To protect all electrical connections with electrical tape
20. To attach charged battery with velcro strap

C. Drone Software and Testing Experiments

1. To install Python program
2. To install Drone controlling Software - ArduPilot
3. To SSH to NAVIO2 to power source and run the emlidtool command
4. To familiarize Arducopter
5. To control Drone using Remote Controller
6. To control Drone using Python Program

CLASS ROOM TRAINING – ONLINE AND OFFLINE

The training includes Single user Classroom / laboratory teaching, learning and simulation software module. The content has easy explanation of various complex topics with animation and simulation for ease of student learning. It also supports learning through videos, graphs, charts, along with mandatory rich content and theory to understand fundamental concepts, interactive learning objects, FAQ, MCQ etc. The content is supplied in digital online access or license protection.

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