USER INSTRUCTION MANUAL

Search and Rescue

Drone

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Preface

This manual is intended for new users with little or no experience using the *Search and Rescue Drone*. The goal of this document is to give a broad overview of the main functions of *Search and Rescue Drone* and some basic instructions on how to set up the drone and instructions about personal safety.

Be sure to read this manual's contents thoroughly to familiarize yourself with the safe and correct use of this product.

*Fly Safe !!!!!*

Essential Safety Precautions

Things to remember before flight….!!!

* All drones that weigh between 250 g and 25 kg must be [registered](https://www.tc.gc.ca/en/services/aviation/drone-safety/register-drone.html) with Transport Canada. Pilots must mark their drones with their registration number before they fly.
* All pilots of drones that weigh between 250 g and 25 kg must [get a drone pilot certificate](https://www.tc.gc.ca/en/services/aviation/drone-safety/get-drone-pilot-certificate.html).
* Fly your drone where you can see it at all times
* Fly away from bystanders, at a minimum distance of 30 meters for basic operations
* Do not fly at the site of emergency operations or advertised events
* Do not fly within 5.6 kilometers (3 nautical miles) from airports or 1.9 kilometers (1 nautical mile) from heliports
* Do not fly anywhere near airplanes, helicopters, and other drones
* Always respect the privacy of others while flying

For more information, visit Transport Canada; [https://www.tc.gc.ca/drone-safety](https://www.tc.gc.ca/en/services/aviation/drone-safety/flying-drone-safely-legally.html)

Getting Started With Drone

* Place your Drone in a flat surface before connecting the battery.
* Connect the battery to Raspberry-Pi computer’s type-C port.
* Connect the fully charged Li-po battery to the XT-60 port found on your Drone
* Wait for the Flight controller to boot up. After booting you can see a green blinking led and a beep sound.
* If you wish to connect the Drone with Ground Control Station(GCS), plug in the USB radio telemetry to the USB port of your laptop.
* Open *Mission Planner* application on your laptop and wait for initialization. (Mission Planner can be installed on your PC using the CD-ROM attached to this User Manual.
* After initialization, select the *COM Port* and set baud rate to *57600* and click on connect.
* After successful connection, you can see the radio telemetry and useful drone parameters on *Mission Planner* application.

Before take-off

* Complete the take-off checklist;
* Make sure the environment and weather condition is safe to fly, if not abort the take-off.
* Check airspace authorization is valid.
* Check bystanders
* Make sure controller sticks are in normal position
* Inspect all components for visible damage
* Calibrate compass
* Calibrate GPS, IMU, and RTH.
* Position drone for launch
* Make sure that the Raspberry Pi is connected to network and data is available on web-page
* Press and hold the safety button on Drone and wait for beep.
* Keep 1-2 meters away from drone before the propellers starts to spin
* Click on the *ARM* button on *Mission Planner* and wait for 1-2 seconds for the propellers to spin.
* Throttle Up, take -off the Drone and gain control on your Drone
* Fly safe

During its flight, the Drone will use the Camera and thermal imaging module to trace and detect humans. Once it detect a human, the Raspberry Pi will send the data to the web-page. User can use the captured frame for verification purpose before sending a rescue team.

RTH or Return to Home autonomously

* Whenever it is safe to do so, turn the knob to down and it will initialize the drone to autonomously return to home location.
* While it is flying to base, if there is a safety issue, take back the manual control by turning the knob UP.
* After successful landing, click on *DISARM* button on *Mission Planner.*
* Disconnect the battery
* Inspect all components for visible damage

Proper Storage and Handling

* Handle the battery with care. Li-Po batteries are very prone to explode
* Do a safety inspection on drone, making a list of any repairs or replacements needing to be performed.
* Make sure to discharge your batteries to between 40 to 65 percent, then store them unplugged in a fireproof container, such as a Lipo-bag, in a cool room.
* Check the battery every 3-4 Weeks.
* Make sure to fully charge the batteries for the raspberry Pi

Troubleshooting

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Problem | Cause | Solution |
| 1 | Flight controller LED blinking in Blue-Red color | FC is still initializing | Wait for couple of seconds, or restart the flight controller |
| 2 | Mission Planner not connecting to drone | Wrong COM port selection/baud rate. | Make sure that the COM port/baud rate are correct |
| 3 | RC controller response is high | RC controller in wrong calibration | RC controller needs calibration/battery change. Calibrate RC using GCS. |
| 4 | No data on web-page | Raspberry Pi is not connected to network | Connect the Raspberry Pi to network on contact a technician. |
| 5 | Drone banking to side | Wrong servo config/tuning | Tune the Servo using trimming buttons on RC |
| 6 | Battery draining so fast | Battery life expired | Replace battery |