

SearchWing Drone – Preliminary Datasheet

Release V3, Date: 20.9.2021

The SearchWing Drone is an autonomous unmanned aerial vehicle that searches for boats on the ocean. The drone is designed to be operated by the regular crews on the rescue vessels. It takes GPS tagged photos ready for download and analysis after landing.

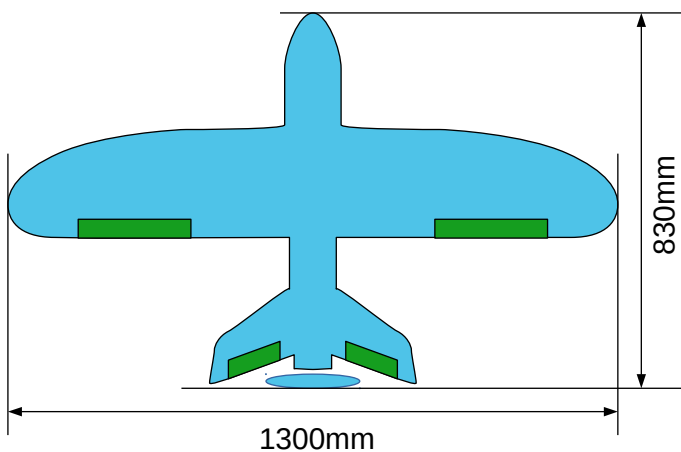


Fig. 1: SearchWing Drone

Key Features

- Launch from rescue vessels like Nadir, Sea-Watch 4, Sea-Eye 4, Ocean Viking
- Range: 50 km + 50 km reserve battery capacity
- Landing in Water – Retrieval with RIB
- Component cost of plane approx. 700 Euro, excl. laptop and ground equipment
- Image Download and machine supported image analysis after landing

Dimensions + Speed



- Wingspan: 1300mm
- Length: 830mm
- Weight: 2 kg
- Maximum Speed: 100 km/h
- Cruise Speed: 45 km/h
- 2 x 8 Megapixel Camera (3280 x 2464) pixel

Fig. 2: Drone Dimensions

Required installation onboard

- 230V Power Supply for Laptop, battery charger and image download box
- 868 MHz 5dBi telemetry antenna (819 mm vertical length, 580g) installed outdoor
- Antenna Ground Box close to antenna with 24V supply (300mm x 300mm x 180mm)
- Clean water to rinse the plane from salt water

Transport

The wings and the fuselage are detachable. The transport box size is 50x50x100 cm.

Flight preparation

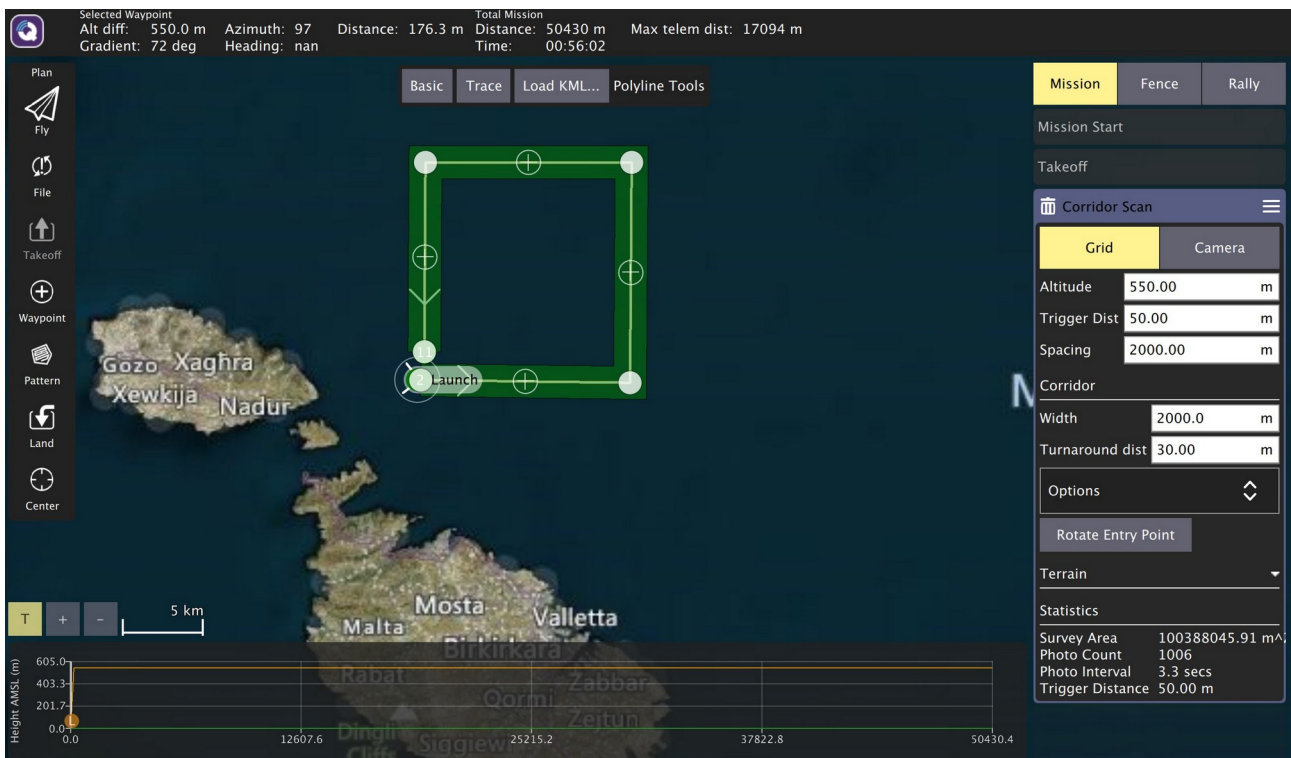


Fig. 3: Flightplanning with QGroundControl

The flightplan is defined before launch on the laptop and then transferred to the drone via the telemetric link. The drone will follow the flight plan fully autonomously. The plane contains a battery that can be charged with supplied charge equipment. The depicted example flight plan with a total flight distance of 50km covers an area of 100 km² on the ground at an image ground resolution of 20cm/pixel. The target flight altitude is 550 m.

Launch procedure and operation

The SearchWing drone is launched by hand from the vessel. During flight, the position of the drone can be monitored via the telemetric link. The flight can be modified or aborted at any time during flight. The drone will then return to the ship.

Landing procedure

After the flight plan is finished, the drone returns to the rescue vessel and will circle in a distance of 100m from the vessel at an altitude of 50m. After the landing procedure is triggered, the drone will land in a distance of 10m-30m from the vessel in the water. The SearchWing drone is waterproof and will stay afloat. The drone is then retrieved with the RIB.

Image analysis

The photos are downloaded from the drone to the laptop via Wifi. The images are GPS tagged and can be viewed on the laptop. An example image from Bodensee (without tag) is here:

<https://www.hs-augsburg.de/homes/beckmanf/dokuwiki/doku.php?id=searchwing-flug-virus-20181007>

Object detection algorithms support the analysis of the images to find boats on the water.

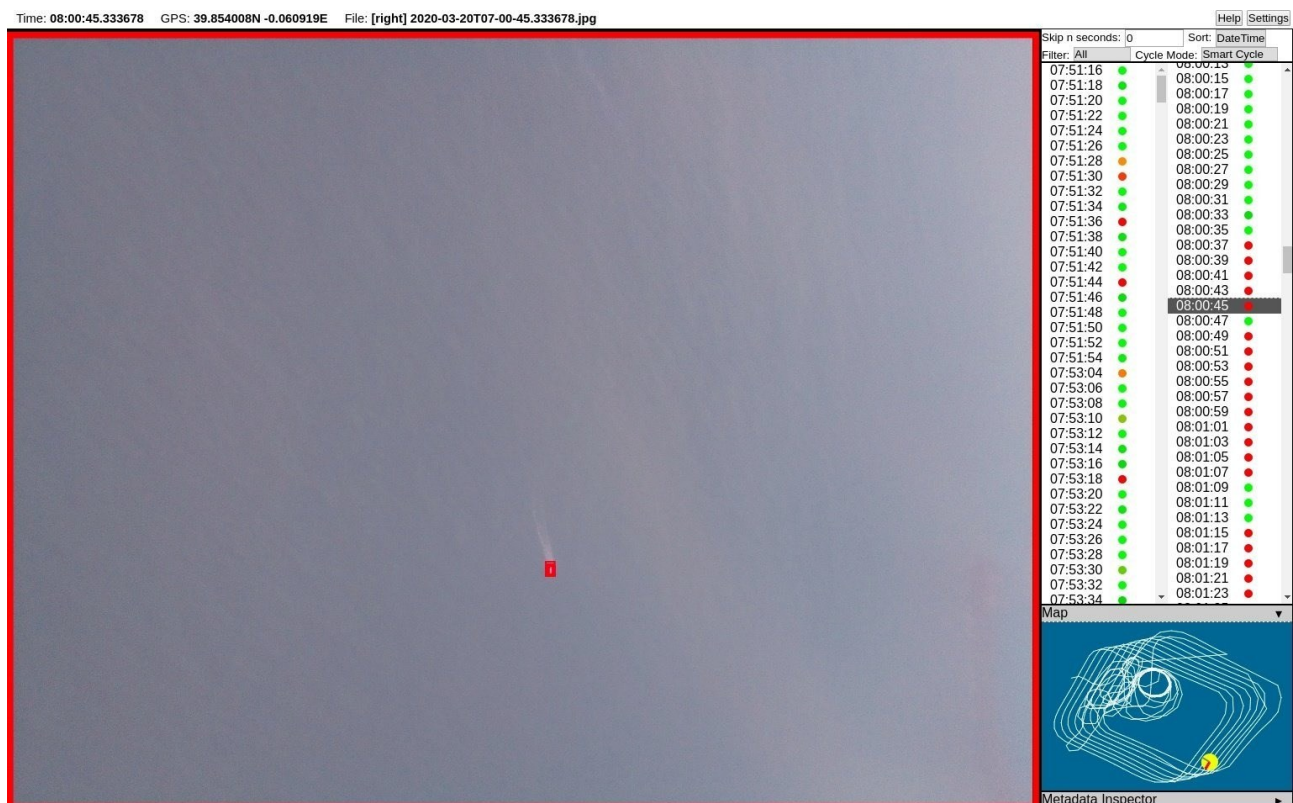


Fig. 4: Image analysis software with automatic object detection

Legal

The drone is operated beyond visual line of sight (BVLOS), i.e. the pilot does not see the drone visually during operation. This kind of operation is not allowed for example in Germany and in many other countries. Operation is therefore restricted to areas outside territorial waters.

Further Information

Website: <https://searchwing.org>

Info Movie: <https://youtu.be/9zOFeO0gwQQ>

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