

# USV TECHNICAL INFORMATION

## Dual frequency sonar



Using a versatile custom built USV (Unmanned Surface Vessel), we provide a dual frequency sonar imaging service using intelligent autonomous auto pilot programming and sonar transducer combined with mapping software that produce intuitive data sets in ponds, lagoons and sheltered waters.

The USV carries a PC run dual frequency sonar platform, built specifically for imaging sediments in shallow waters. Unique to most dual frequency sonars, this has the ability for the low channel (LF) to be user selected/calibrated in the field. This calibration can be done next to a manual verification recording which is a key component in knowing the sonar is reading accurately on any specific waterbody. The onboard PC running a hydrographic software records both high and low channels as well as GNSS data simultaneously. The dual frequency sonar has very narrow beam widths (HF 5° and LF 3.5°) allowing it to work in very shallow waters at a minimum depth of 0.24m (0.8ft), ideal for small ponds and lagoons with sloped edges. Equipped with noise thruster protection in the sonar, allowing low frequencies to operate without interference from the electronic motors and thrusters.

The USV is piloted using a Herelink controller which is an integrated remote controller, ground station and wireless digital transmission system, paired with a PX4 auto pilot system for unmanned vehicles. This integrated controller and auto pilot allows for autonomous and RC control, 1080 HD Video and telemetry data to be transmitted simultaneously on one channel which allows for a small working foot print.

The controller is loaded with a ground control software that allows for mission planning and configuration as well as mission map display showing the USV position, tracking, waypoints and USV instruments. Live video streaming is also viewed and recorded on the controller, which can help with navigation around vegetation and obstructions.

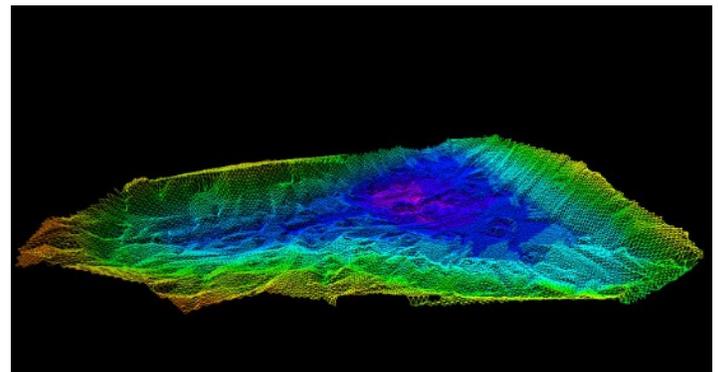
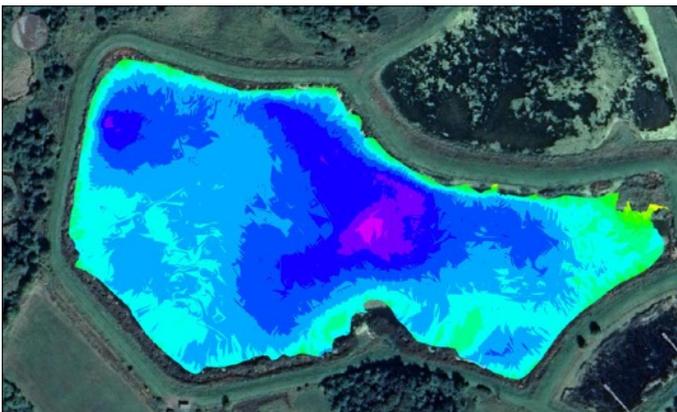
The USV auto pilot software is programmed by the USV Pilot to follow a systematic grid or circular pattern, with lines of travel set to certain distances apart to achieve a thorough and extensive coverage of the water.



### USV SPECIFICATIONS

- 1000mm L x 700mm W x 460mm H
- Weight 16 kg, Payload 10 kg
- 100% battery operated
- x2 350 watt brushless shrouded thrusters
- 3.8 knots max speed, 1.9 knots working speed
- Shoreline or boat launch-able
- 2-4hr run times, field swappable batteries
- Autonomous & RC controlled
- Long distance autonomous transmission
- Front facing HD camera
- Tough GRP construction

As every waterbody is different, an added layer in our workflow allows us to take manual verifications via our CORETAKER sludge judge at one or more points on the water and calibrate the LF channel on the sonar before carrying out the imaging. Manual verification data is supplied in the final summary. All images and reports can be delivered in a range of formats to suit your project requirements. Survey areas are saved for future repeat surveys over the same area, allowing for accurate repeat coverage to compare technical data time and time again.



As a final deliverable, a site specific summary with all data collected in the field with processed depth and sediment maps and sediment volume data calculated by the software are provided in a detailed pdf format. All image files can be delivered separately as well as RAW data for in house processing.

Export file options include: AutoCad DXF, ESRI Shape, jpeg, png, gif, tif and Google Earth kml/kmz, 3D Viewer.