



OPENSAP.IT
SHALLOW WATER
AUTONOMOUS PROSPECTOR

PROAMBIENTE
innovation & environment

Your Autonomous Surface Vehicle

OpenSWAP a remotely controlled, fully Autonomous Surface Vehicle (ASV) for geophysical surveys, video inspections and custom applications. Designed to study and monitor various environments, it's light-weight, low-cost, fully customizable and compatible with most common GPS and sensors.



MAIN FEATURES:

- » Arduino/Raspberry based platform;
- » Integrated Single-beam echo sounder (12°@200KHz) w/bottom tracking and seg-y records + temperature sensor;
- » Easy to transport and deploy
- » Small size and weight (120x120 cm x 25kg basic version);
- » Up to 14 hours w/ 4 battery pack @ typical survey speed (1.5-2 knots);
- » Easily customizable by end-user or on-demand;

MODULAR UNMANNED CATAMARAN
AUTOMATIC MISSION PLANNING
REMOTELY CONTROLLED
RAPID DEPLOYMENT
LESS MAINTENANCE
SAVE TIME & MONEY



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AVAILABLE INTEGRATION:

- EXTERNAL GPS (eg. Trimble);
- ADCP ACOUSTIC CURRENT DOPPLER PROFILER (eg. RDI RiverPro);
- SIDE-SCAN SONAR (eg. Starfish);
- MULTIBEAM ECHOSOUNDERS w/ CUSTOM MRU (Octans emulation);
- MULTIPARAMETRIC SENSOR (CTD);
- WATER SAMPLING;



120 x 120 cm LLDPE electric catamaran



ACCESSORIES > antennas, Joypad and LiPO battery



GPS COMPATIBILITY

OPEN SWAP IS COMPATIBLE WITH EXTERNAL GPS VIA RS232 CONNECTION OR WI-FI CONNECTION THROUGH THE FOLLOWING INPUT SENTENCES:

**NMEA-GGA (5HZ), NMEA-ZDA (1HZ), NMEA-GSA (1HZ)
ALL THESE SENTENCES ARE MANDATORY.**

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DATA OUTPUT

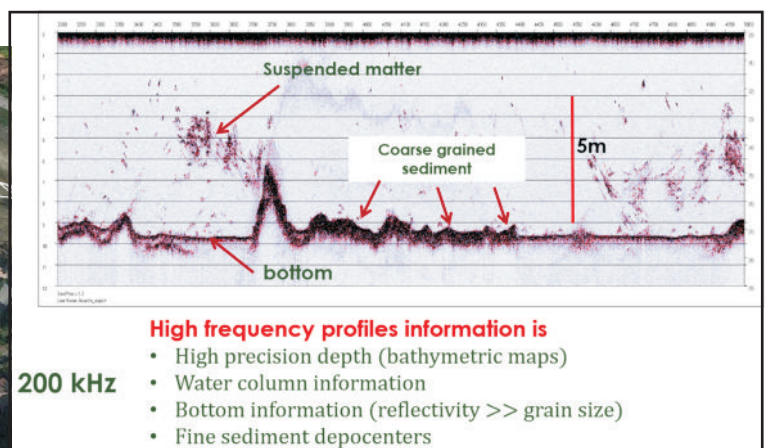
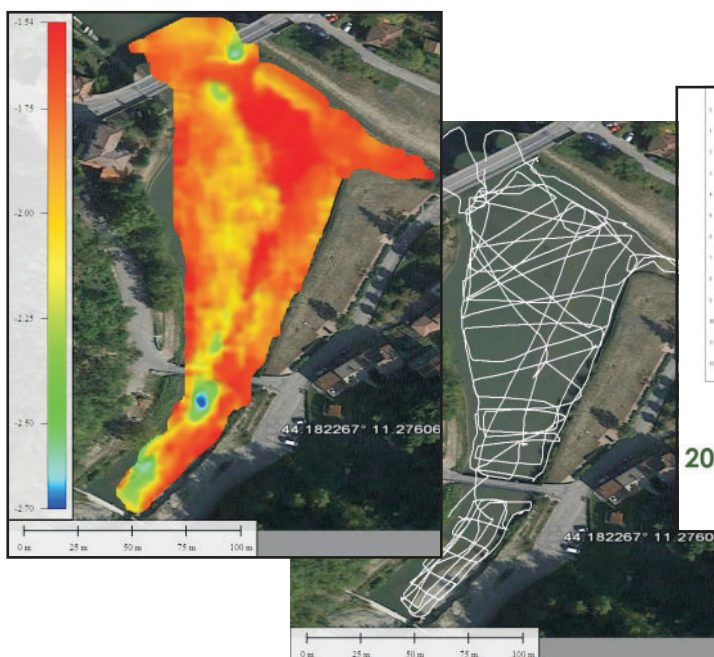
THE OUTPUTS ARE 4 TEXT STRINGS, WRITTEN ON USB PEN DRIVE, WHEN CONNECTED, OR IN THE INTERNAL MICROSD OF RASPBERRY PI. PATH IS /DATA/

STORED FILES ARE:

\$OSDBT – DEPTH BELOW TRANSDUCER
\$OSDPT – DEPTH OF WATER
\$IIIXDR – TRANSDUCER MEASUREMENT & WATER TEMP
\$GPGGA - POSITION FROM GPS CONNECTED*
*external or integrated

SEG-Y* FILES OUTPUT

* the open SEG-Y standard seismic data is a geophysical format containing information about the entire echogram. Post-processing of seg-y allow to obtain information about reflectivity, grain-size and depocenter of the upper sediment. (See image below)



High frequency profiles information is

- High precision depth (bathymetric maps)
- Water column information
- Bottom information (reflectivity >> grain size)
- Fine sediment depocenters



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TECHNICAL SPECIFICATION

Dimensions:

Catamaran Length x Width.....120x120 cm (Hull 120x30 cm)
Hull & Central Case Material.....LLDPE
Hatches.....screw caps with gasket IP67:
2x 24 cm and 2x 12.2 cm – Hull
1x 43.5 cm diameter– Central Case
Weight.....25 kg (w/ 4x LiPO(4S)20Ah battery)
Additional Payload.....40 kg max
Draft.....20 cm

Electrical:

Power.....12-16VDC provided by 4 x LiPOs
(4S) 20Ah battery pack
Motors.....4 brushless (4x 350Wmax)
w/ protection grid

Navigation Capability:

Typical Survey Speed.....1.5-2 knots (3.5 knots max)
Battery Endurance.....10 hours (@Typical Survey Speed)
Radio Control/Link Range.....1,5 km @ 433MHz(telemetry)
500 m @ 2.4/5GHz (echosounder)
NavigationSoftware.....OPENSWAPNAV (Linux) routes
planning and real-time remote
control with GIS technology using
free database of land images

Sensors and I/O:

Integrated Positioning System.....GPS UBLOX-True heading w/
double antenna (dynamic heading
accuracy 0.3° - 50% @ 30m/s)
Horizontal position accuracy
(standalone) = 2.5m CEP
External GPS.....Compatibility with NMEA GPS
(w/ RS232-Serial Adapt or WIFI link)
Inertial Motion Unit.....10 DOF MEMS w/ HDG correction
when GPS RTK HDG fails
Single Beam Echosounder12°@200KHz with echo display and
bottom tracking > record of SEG-Y
files and NMEA \$DPT bottom values
with temperature in logfiles
Depth Accuracy.....1cm/0.1% of depth (0.5 to 50m)
Acquisition Software.....SWSCONTROL (Linux) realtime
remote controller for echosounder
bottom tracking and SEG-Y record
Auxiliary Ports.....several I/O analog and digital port
(5V tolerant)
Video.....video streaming (@2.4 GHz) w/ 8MP
Wide Angle 110° frontal camera

