SPH Engineering

EchoNIMBUS-MBES – Drone-Based Multibeam Echosounder

The EchoNIMBUS-MBES integrated with SPH Engineering's UgCS SkyHub system transforms UAVs into efficient bathymetric survey tools.

Mounted beneath a drone and operated from the air, the EchoNIMBUS-MBES captures precise 3D bathymetric data over shallow and difficult-to-access waters, such as reservoirs, rivers, ponds, or flooded areas.

This drone-based solution eliminates the need for manned boats, providing a safer and faster workflow. Each flight collects dense bathymetric coverage for high-fidelity bottom modeling, making it ideal for engineering, environmental, and hydrographic applications.

Main Features

- 240 kHz multibeam sonar with 16 beams for high-definition bathymetry
- Fully integrated with **SkyHub – Drone onboard computer**
- Real-time depth measurements through **UgCS Custom Payload Monitor**
- Compact and lightweight design optimized for drone operations
- Automated data logging and geotagging
- Rapid deployment
- Suitable for tailings ponds, stormwater basins, hard-to-access sites, small reservoirs, and coastal areas where survey boat mobilization is too high.

Main Parameters

Parameter	Value
Sensor	Surveyor 240-16
Type	MBES (multibeam)
Acoustic frequency, kHz	240
Measurement range	0.5 … 50m
Along track TX beam width	4°
Cross track TX beam width	80°
RX array # elements	16
Cross track beam width	7° (conventional beamforming)
Cross track angular resolution	1° (angle of arrival)
Range resolution	0.5% of range setting
Weight of the echo sounder (in the air, including foldable mounting), kg	1.8
Weight of all components (in the air), kg (sensor, SkyHub, altimeter, housing, cables, mountings)	2.4

System components

- Surveyor 240/16 MBES sensor
- SkyHub onboard computer
- UgCS EXPERT Software License
- BeamworX software for data processing and point cloud generation
- Power and data cables, mounting kit, user manual
- Set of trainings

Best Conditions for Operation

- Still and slow-moving waters.
- Stable conditions are required for accurate readings.
- Fast-flowing rivers and creeks can be surveyed using the Zig-Zag flight pattern.

Workflow

Plan & execute flight using UgCS and True Terrain Following.

Collect bathymetric data with EchoNIMBUS-MBES.

Process and visualize results in BeamworX and DroneGIS.

Export results CSV, GeoTIFF, LAZ and many other formats for GIS import.

Applications

- Inland water bathymetry (reservoirs, rivers, ponds)
- Tailings pond and mine water surveys
- Sediment volume and erosion assessment
- Environmental and hydro-engineering projects
- Flood mapping and infrastructure monitoring

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