

SBE-218D

Compact Single-Beam Echosounder for Small Unmanned Surface Vehicle 218 kHz / 50 kHz



Overview

The SBE-218D is a high-frequency single-beam echosounder developed for small inland-water survey unmanned surface vehicles (USV). It adopts an integrated deck-unit-free design, featuring compact dimensions and powerful performance. This dual-frequency Chirp single-beam echosounder features a primary survey frequency of 220 kHz and a backup deep-water frequency of 50 kHz, covering measurement scenarios from 0.15 m to 450 m. Built-in adaptive bottom-tracking algorithm greatly mitigates interferences induced by roll/pitch motion of small USVs and side-slope clutter, ensuring continuous and stable bathymetric data under rough water conditions. The equipment supports simplified one-touch start-stop operation for user-friendly control. It is suitable for routine river-lake topographic survey as well as maximum-depth sounding, delivering excellent overall operational efficiency and environmental adaptability.

Applications

- Adaptive bottom-tracking algorithm dynamically filters clutter, wave-induced noise and fish echoes to maintain reliable bottom lock for stable output.
- Enhanced roll-and-pitch tolerance (up to $\pm 10^\circ$), solving the common bottom-loss issue of small USVs under wave conditions.
- Standard Chirp modulation technology across the full series for improved signal-to-noise ratio and better adaptability to turbid water.
- Built-in automatic parameter optimization; one-touch start-stop enables rapid commissioning.

Technical Specifications

Item	Parameter
Frequency	218 kHz / 50 kHz
Beam Opening Angle	9° (218 kHz), 45° (50 kHz)
Depth Range	0.15 m ~ 450 m
Measurement Accuracy	0.1%h ± 1 cm @220 kHz (h = water depth); 0.1%h ± 10 cm @50 kHz (backup frequency, for flat open water only)
Resolution	1 cm
Maximum Ping Rate	30 Hz
Maximum Transmit Power	350 W
Power Supply	DC 9-28 V
Water Temperature Sensor	-2 °C ~ +35 °C, ±1 °C, for real-time sound-velocity correction
Power Consumption	Typical: 5 W; Peak: 13 W
Interfaces	RS232, Ethernet; supports firmware OTA upgrade
Dimensions	Φ45 mm × 110 mm (cable excluded)
Weight	≤400 g
Material	Aluminum alloy + PEEK (transducer radiating face)
Ingress Protection	IP68
Temperature	Storage: -40 °C ~ +70 °C; Operating: -20 °C ~ +60 °C