

EM[®] 124 Multibeam Echo Sounder



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Widest swath 12 kHz

The EM124 consists of new, state-of-the-art electronics and separate transmit and receive transducers in a Mills Cross configuration. It utilizes the same field-proven transducers as the EM122, making it **easy to upgrade**. Due to a flexible transducer design, the system can be tailored to **almost any required size**.

The largest standard size, 0.5 x 1 degrees, gives the ultimate system performance in terms of resolution and range, while a smaller 4 x 4 degrees solution allows full ocean depth surveys even on smaller vessels. The EM124 is designed to perform seabed mapping to full ocean depth with an unsurpassed resolution, coverage, and accuracy. The swath width is typically 6 times the water depth to almost 4000 m depth. With a low noise vessel, a **swath width of more than 40 km** has been achieved.

Full Seabed Coverage

In dual swath mode, the transmit fan is divided into up to 8 sectors shallow modes and 16 in deep modes. This allows for unique control of the transmit fan, enabling active stabilization in real time to correct for any yaw and pitch movement of the vessel, while roll stabilization is applied on the receiving beams. The result is a stabilized system for full ensonification of the seabed with equally distributed footprints, even in bad weather conditions, leaving no gaps or holes in the mapped area. All beams are maintained and automatically adjusted according to achievable coverage or operator defined limits. Up to 1600 individual beams are available in dual swath mode. Two individual transmitting fans are generated with a small difference in tilt giving a constant sounding separation alongtrack, resulting in a dense sounding pattern on the seafloor.

Key Features

- Frequency range 10.5-13.5 kHz
- Clean and high resolution data
- Modular and flexible design
- Roll, pitch and yaw stabilization in real time
- Transmit and receive nearfield focusing
- Marine mammal protection
- Ice windows available
- Sub Bottom Profiler integration available
- Backscatter calibration service available



Technical Specifications

Common Options	0.5° x 1°	1° x 1°	1° x 2°	2° x 2°	2° x 4°	4° x 4°
TX Length	15.26 m	7.77 m	7.77 m	4.02 m	4.02 m	2.02 m
RX Length	7.20 m	7.20 m	3.60 m	3.60 m	1.81 m	1.81 m
No. of TX modules	96	48	48	24	24	12
No. of RX modules	16	16	8	8	4	4
Max no. of beams per ping	1024*	1024*	1024	1024	512	512

*1600 in high density mode

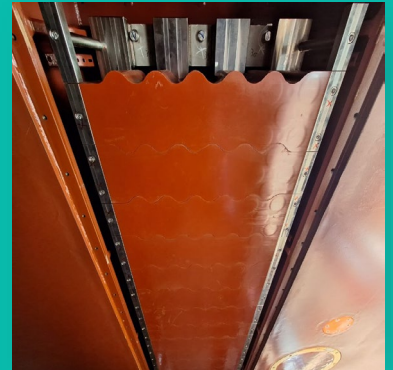
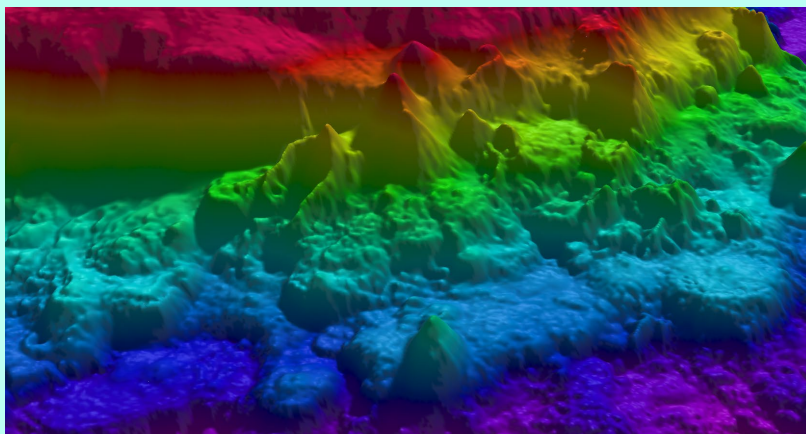
Frequency range	10.5 to 13.5 kHz	Roll stabilized beams	±15°	Transmitter Unit dimensions (W x H x D) and weight	606 x 898 x 612 mm	72-96 kg
Ping rate	> 5 Hz	Pitch stabilized beams	±10°	Receiver Unit dimensions (W x H x D) and weight	488 x 285 x 420 mm	21 kg
Swath coverage sector	Up to 150°	Yaw stabilized beams	±10°	Beam patterns	Equidistant and equiangular	

Clean, high resolution data

Due to the sector transmission technique, the system produces a strong dampening of multi-bounce interference from false echo, resulting in significantly cleaner data. Near-field beam focus is applied in real time, both during transmission and reception. Due to sector transmission the focal point will be individual for each sector, resulting in a much sharper transmit beam over the entire swath. On reception, the focus is applied dynamically for each beam. The result is a much higher resolution representation of the seabed.

Ice windows

Acoustic ice protection windows can be offered for vessels going to the ice edge and for ice breakers. TX ice windows are made of polyether urethane, reinforced with titanium rods, available in 45 or 100 mm thickness. RX ice protection is a single welded sheet of grade 5 titanium, available in 10 or 20 mm thickness.



Data images: EM124 data collected using R/V Atlantis during an NSF and NERC sponsored research expedition to the Galápagos Platform in April 2023 (AT50-09). Front bottom, British Antarctic Survey. Lower right, Schmidt Ocean Institute.