



30 KHZ MULTIBEAM ECHO SOUNDER

The EM 302 multibeam echo sounder is designed to perform seabed mapping with high resolution and accuracy to a maximum depth of more than 7000 m.

Beam focusing is applied both during reception and transmission. EM 302 is equipped with a function to reduce the transmission power in order to avoid hurting mammals if they are close by.

The system has up to 432 soundings per swath with pointing angles automatically adjusted according to achievable coverage or operator defined limits.

With dual swath (two swaths per ping) the transmit fan is duplicated and transmitted with a small difference in alongtrack tilt. The applied tilt takes into account depth, coverage and vessel speed to give a constant sounding separation alongtrack.

In dual swath mode, 2 swaths are generated per ping cycle, with up to 864 soundings. The beam spacing is equidistant or equiangular.

EM 302 uses both CW and FM pulse forms. FM sweep with pulse compression on reception is used to increase the maximum useful swath width. The FM pulses will also increase the resolution compared to CW pulses of the same length.

The transmit fan is split in several individual sectors with independent active steering. This allows stabilization which compensates for the vessel movements: yaw, pitch and roll. Each transmit sector has individual beam focusing.

The EM 302 transducers are modular linear arrays in a Mills cross configuration with separate units for transmit and receive. The transmitter array is available as 0.5, 1, 2, or 4 degree resolution, while the receive array is available as 1, 2, or 4 degrees.

The receive transducer is wideband. In conjunction with a separate low frequency transmit transducer, the EM 302 may optionally be able to deliver sub-bottom profiling capabilities with a very narrow beamwidth. This system is known as the SBP 300 sub-bottom profiler.

FEATURES

- Depth range from 10 to 7000 m
- Swath width up to 5.5 times water depth/8 km
- Focused beams for transmission and reception
- High density and multiping modes for increased resolution
- Up to 864 soundings per ping
- Yaw, pitch and roll compensation and stabilisation
- High accuracy
- Seabed image (sidescan) data display and recording
- Water column data display and recording
- Modular design, beamwidths 0.5 to 4 degrees
- Integrated sub-bottom profiler available
- Mammal protection
- Compliant to IHO S-44 order 1A



TECHNICAL SPECIFICATIONS

EM 302 performance data

Operating frequency	30 kHz	Suppression of sounding artefacts	8 frequency coded transmit sectors per swath
Depth range	10-7000 m	Beam focusing	On transmit and receive
Swath width	5.5xdepth, to more than 8 km	Beamforming method	Time delay
Pulse forms	CW and FM chirp	Gain control	Automatic
Swath profiles per ping	2	Swath width control	Manual or automatic, all soundings intact when reduced swath width
Motion compensation:		Seabed imagery/sidescan sonar image	Standard
• Yaw	± 10 degrees	Water column display	Standard
• Pitch	± 10 degrees	Mammal protection	Standard
• Roll	± 15 degrees	Sub-bottom profiling	Yes, by integration with SBP 300 or Topas
Sounding pattern	Equidistant / equiangular		
Range sampling rate	3.25 kHz (23 cm)		
High resolution mode	High density processing		
Sidelobe suppression	> 25 dB		
Effective pulse length	0.4 ms CW to 200 ms FM		

Versions of EM 302						
System version (TX/RX):	0.5 x 1	1 x 1	1 x 2	2 x 2	2 x 4	4 x 4
Max no of soundings/swath	432	432	432	432	216	216
Max no of swaths per ping	2	2	2	2	2	2
Max no of soundings/ping	864	864	864	864	432	432

Laptop, HWS and monitor can be delivered on request.

Front page image: Seamounts mapped in 2014 by the NOAA Ship Okeanos Explorer in the North Atlantic. The data is courtesy of NOAA Office of Ocean Exploration and Research

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