



EM 712 0.5 x 0.5 degrees

MULTIBEAM ECHO SOUNDER

The EM 712 multibeam echo sounder is a high to very high resolution seabed mapping system capable of meeting all relevant survey standards. The minimum acquisition depth is from less than 3 m below its transducers, to a maximum of approximately 3500 m, somewhat dependant upon array size. Across track coverage (swath width) is up to 5.5 times water depth, to a maximum of more than 3500m.

Echo sounder models

There are three basic versions of the EM 712 system, with different range performances:

- EM 712 - Full performance version.
- EM 712S - CW pulse forms only.
- EM 712RD - Short CW pulse only.

Choice of beamwidths

The transmit and receive beamwidth depends upon the chosen transducer configuration with 0.5, 1 and 2 degrees available as standard.

Innovative acoustic principles

The EM 712 operates at sonar frequencies in the 40 to 100 kHz range. The transmit fan is divided into three sectors to maximize range capability, but also to suppress interference from multiples of strong bottom echoes.

The sectors are transmitted sequentially within each ping, and uses distinct frequencies or waveforms.

EM 712S and EM 712RD both use CW pulses of different lengths. The full performance version, EM 712, supports even longer, compressible waveforms (FM sweep).

Fully stabilized and focused beams

The system applies beam focusing to both transmit and receive beams in order to obtain the maximum resolution also inside the acoustic near-field.

During transmission, focusing is applied individually to each transmit sector with a focus point on the range defined by the previous ping, to retain the angular resolution in the near field. Dynamic focusing is applied to all receive beams. The transmit beams are electronically stabilized for roll, pitch and yaw, while the receive beams are stabilized for roll movements.

Transducers

The active elements of the EM 712 transducers are based upon composite ceramics, a design which has several advantages, in particular increased bandwidth and tighter performance tolerances. Normal transducer mounting is flush with the hull, in a blister or in a gondola. The 1x2 degrees and 2x2 degrees versions can be mounted on a pole for portable deployment.

Electronics

The EM 712 electronics consist of Transmitter Unit, Receiver unit, Processing unit and Work station. The EM 712 electronics system is a true wideband design. The transmitter circuits are fully programmable to support any frequency or pulse form. The use of FM sweep as a pulse form allows for more energy per pulse and thus increased range performance, without any sacrifice of range resolution. Filters, correlators and beamformers are fully digital implementations, and the beam forming method is by time delays, to allow for the wide frequency band of the system.

FEATURES

- High resolution
- Wide frequency range
- FM chirp
- Roll, pitch and yaw stabilization
- Nearfield focusing
- Water column display
- Seabed image
- Dual swath
- Modular design

- Options:
- Water column logging
 - Extra detections



TECHNICAL SPECIFICATIONS

Frequency range	40 to 100 kHz
Max ping rate	30 Hz
Swath coverage sector	Up to 140 degrees
Min depth	3 m below transducer

Max depth (approximate values)	EM 712 0.5 x 0.5°	EM 712S 1 x 2°	EM 712 RD
	3600 m	1800 m	600 m
CW transmit pulses	0.2 to 2 ms	0.2 to 2 ms	0.2 ms
FM sweep pulse	Yes	No	No

Roll stabilized beams	Yes, ±15°
Pitch stabilized beams	Yes, ±10°
Yaw stabilized beams	Yes, ±10°
Sounding patterns	Equiangular
	Equidistant

Transducer choices	0.5 x 0.5 deg.	0.5 x 1 deg.	1 x 1 deg.	1 x 2 deg.	2 x 2 deg.
Availability	Not EM 712 RD	Not EM 712 RD	Not EM 712 RD	All models	All models
TX dimensions (L x W x H)	1940 x 224 x 118 mm	970 x 224 x 118 mm	970 x 224 x 118 mm	970 x 224 x 118 mm	490 x 224 x 118 mm
RX dimensions (L x W x H)	1940 x 224 x 118 mm	970 x 224 x 118 mm	970 x 224 x 118 mm	490 x 224 x 118 mm	490 x 224 x 118 mm
Max no. of soundings per ping (Dual swath mode)	1600	800	800	400	400

Transmitter Unit dimensions (W x H x D) and weight	600 x 380 x 600 mm	71 kg (for 0.5 degrees TX array)
Receiver Unit dimensions (W x H x D) and weight	250 x 350 x 260 mm	11 kg

		0.5 x 0.5 deg.	0.5 x 1 deg.	1 x 1 deg.	1 x 2 deg.	2 x 2 deg.
Max coverage	winter*	3600	3400	3200	3000	2800
Max coverage	summer*	4200	3900	3650	3450	3250
Max depth	winter*	3400	3250	3100	2900	2700
Max depth	summer*	3600	3400	3300	3150	3000

* Estimated depth and coverage for EM 712, based on BS= -20dB, NL= 35 dB, f = 40 kHz

Specifications subject to change without any further notice.

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