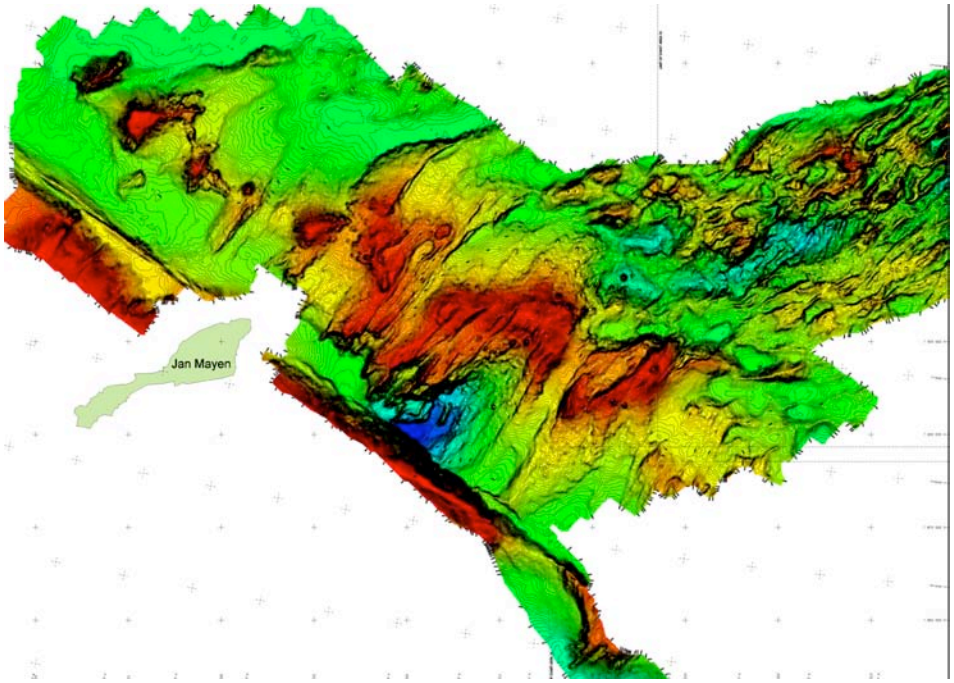
EM 122

12 kHz multibeam echo sounder

KONGSBERG

- **Depth range from 20 to 11000 m**
- **Swath width up to 6 times water depth/30 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 stabilization**
- **High accuracy**
- **Seabed image (sidescan) data display and recording**
- **Water column data display and recording**
- **Modular design, beamwidths 0.5 to 4 degrees**
- **Dual and triple frequency versions possible**
- **Integrated subbottom profiler available**
- **Mammal protection**



The EM 122 12 kHz multibeam echo sounder is designed to perform seabed mapping – bathymetry and seabed imagery- to full ocean depth with an unsurpassed resolution, coverage and accuracy. It represents a major improvement from previous models by offering significantly larger swath width, improved data density, and greatly improved resolution. Beam focusing is applied both during reception and transmission.

EM 122 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 288 beams/432 soundings per swath with pointing angles automatically adjusted according to achievable coverage or operator defined limits. In multiping mode, 2 swaths are generated per ping cycle, with up to 864 soundings. The beam spacing is equidistant or equiangular.

In high density mode more than one sounding can be produced per beam, such that the horizontal resolution is increased and is almost constant over the whole swath.

EM 122 uses both CW pulses and FM sweep pulses with pulse compression on reception, in order to increase the maximum useful swath width.

The transmit fan is split in several individual sectors, with independent active steering, according to accomplish compensation for the vessel movements: yaw, roll and pitch.

With multi-ping (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.

The EM 122 transducers are modular linear arrays in a Mills cross configuration with separate units for transmit and receive. The projector 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 122 may optionally be able to deliver sub-bottom profiling capabilities with a very narrow beamwidth. This system is known as the SBP 120 Sub-Bottom Profiler.

Dual or triple frequency versions can be obtained by integration with other EM multibeams at 30, 100 or 300 kHz.

EM 122 performance data

Operating frequency ..... 12 kHz
Depth range ..... 20-11000 m
Swath width ..... 6 x Depth, to approx 30 km
Pulse forms ..... CW and FM chirp
Swath profiles per ping ..... 1 or 2
Motion compensation:
- Yaw ..... ± 10 degrees
- Pitch ..... ± 10 degrees
- Roll ..... ± 15 degrees
Sounding pattern ..... Equi-distant on bottom/equiangular
Depth resolution of soundings ..... 1 cm
High resolution mode ..... High Density processing
Sidelobe suppression ..... - 25 dB
Suppression of sounding artefacts ..... 9 frequency coded transmit sectors
Beam focusing ..... On transmit (per sector) and on reception (dynamic)
Beamforming method ..... Time delay
Gain control ..... Automatic
Swath width control ..... Manual or automatic, all soundings intact even with reduced swath width
Seabed imagery/sidescan sonar image ..... Standard
Water column display ..... Standard
Mammal protection ..... Standard
Multi frequency operation ..... Yes, by integration with EM 3002, EM 710 and/or EM 302
Sub bottom profiling ..... Yes, by integration with SBP 120

Versions of EM 122

System version	0.5 x 1	1 x 1	1 x 2	2 x 2	2 x 4	4 x 4
Transmit array [deg]	150 x 0.5	150 x 1	150 x 1	150 x 2	150 x 2	150 x 4
Receive array [deg]	1 x 30	1 x 30	2 x 30	2 x 30	4 x 30	4 x 30
No of beams/swath	288	288	288	288	144	144
Max no of soundings/swath	432	432	432	432	216	216
Max no of swaths per ping	2	2	2	1	1	1
Max no of soundings/ping	864	864	864	432	216	216

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