

EM[®] 2040C MKII



KONGSBERG

MULTIBEAM ECHO SOUNDER

The EM 2040C MKII is a shallow water multibeam echo sounder based on EM 2040 technology. It is an ideal tool for any high resolution mapping and inspection application. With the release of the EM 2040 MKII series Kongsberg Maritime has upgraded the hardware and software to increase the swath and improve the data quality of our EM 2040 series.

Key facts

The system fulfils, and even surpasses, IHO-S44 Exclusive Order and the more stringent LINZ specification.

The operating frequency range is from 200 to 400 kHz with frequency selection in steps of 10 kHz. The operator can on the fly choose the best operating frequency for the application: 300 kHz for near bottom, 200 kHz for deeper waters and 400 or 700 kHz for very high resolution inspection. 700 kHz inspection mode provides the highest resolution available contained within a narrow 30° swath.

By alternating between the frequency modes per ping, the system is capable of providing the operator with Multi Frequency Backscatter of up to 5 frequencies in a single pass. The same functionality allows the system to alternate between a full swath mode and a high resolution mode providing full coverage while maintaining ultra high resolution over a target.

By utilizing both CW and FM chirp pulses, the system can achieve long range capability and still maintain a high resolution. The maximum depth range for a dual head system in cold ocean water is 520 m at 200 kHz with a swath width up to 700 m.

Due to the large operating bandwidth, the system has an output sample rate up to 60 kHz. The system can effectively operate with very short pulse lengths. The shortest pulse is 14 microseconds, which gives a raw range resolution (CT/2) of 10.5 mm. The angular coverage for 200 to 320 kHz modes are 140°

with one sonar head, allowing coverage of 5.5 times water depth. For a dual transducer system, 200° angular coverage or 10 times the water depth is achieved on a flat bottom.

Components

The basic EM 2040C MKII has three components: a sonar head, a processing unit and a workstation. The EM 2040C MKII can be delivered with the standard processing unit or an IP67 rated (24 VDC) portable processing unit.

For real-time motion stabilization and compensation, data input from a motion sensor, heading and a positioning system is required. A sound speed profile of the water column is recommended for real-time correction, especially for a dual head system.

As an option the EM 2040C MKII can be delivered with the dual swath capability, allowing a sufficient sounding density to meet survey coverage standards along track while maintaining a high vessel speed.

All electronics are contained in the sonar head(s) which is interfaced to the processing unit via GBit Ethernet. The processing unit also supplies 48 VDC power via the same cable. Operator control, data quality inspection and data storage is handled by the hydrographic workstation running SIS software or by 3rd party software.

EM 2040C is also available in a 1500m depth rated version with a 130° swath for ROV or AUV operations.

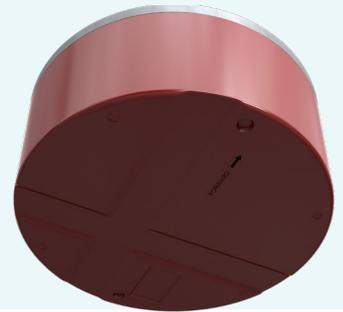
FEATURES

Included Features

- 200-400 kHz wide frequency range
- Seabed image
- Water column display and logging for SIS users
- FM chirp
- Roll, pitch stabilisation
- Yaw stabilisation with dual head
- Short pulse lengths, large bandwidth
- Transmit and receive nearfield focusing
- Easy to install

Optional features

- Dual swath
- 700 kHz mode
- EM® MultiFrequency Mode
- Extra detections
- Water column display and logging
- Water column phase logging
- Dual Head



TECHNICAL SPECIFICATIONS

Frequency range	200 to 700 kHz. 200-400 in steps of 10 kHz
Beam width	1x1° at 400 kHz
Max ping rate	50 Hz
Swath coverage sector	Up to 140° (single head) / 200° (dual head)
Depth Rating	50 meters or 1500 meters
Beam patterns	Equiangular, equidistant and high density
No. of beams per ping	512 single swath single head 1024 dual swath single head / single swath dual head 2048 dual swath dual head
Roll stabilised beams	± 15°
Pitch stabilised beams	± 10°
Yaw stabilised beams	± 10°

Coverage example for EM 2040C MKII with bottom type rock (BS = - 10 dB), NL = 45 dB, FM mode

Operating frequency	Max depth	Max coverage across	
		Single Head	Dual Head
200 kHz	520 m	580 m	700 m
300 kHz	450 m	580 m	670 m
350 kHz	400 m	510 m	600 m
400 kHz	350 m	375 m	530 m
700 kHz	45 m	23 m	Not available

	CW pulse 200-400 kHz	FM pulse 200-400 kHz	CW pulse 700 kHz
Pulse lengths	14, 27, 54, 135, 324 & 918 µs	3 & 12 ms	70 µs

Beamwidth					Physical dimensions (excluding connectors and mounting arrangements)	
200 kHz	300 kHz	350 kHz	400 kHz	700 kHz	Dimensions	Out/in water Weight / depth rating
2°	1.3°	1.15°	1°	0.6°		
Sonar Head EM 2040C MKII					332x119 (ØxH)	18.8/8.4 kg / 50 m
Sonar Head EM 2040CX					332x122 (ØxH)	26.1/17 kg / 1500 m
Processing Unit (2U for 19" rack)					482.5 x 424 x 88.6 mm (WxDxH)	10.5 kg
Portable Processing Unit (IP67)					370 x 390 x 101 mm (WxDxH)	10.5 kg

Laptop, Hydrographic Work Station (HWS) and monitor can be delivered on request.

Specifications subject to change without any further notice.

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Front page image: EM 2040C, captured at Cantabria Spain, Courtesy of Secretaria General de Pesca-Tragsatec, Spain

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