

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 operating frequency range is from 200 to 400 kHz with frequency selection in steps of 10 kHz, enabling the user to choose on the fly the best operating frequency for the application. Due to the large operating bandwidth available, the system has an output sample rate up to 60 kHz. The system can effectively operate with very short pulse lengths, the shortest pulse being 14 microseconds giving a raw range resolution (CT/2) of 10.5 mm.

By utilizing both CW and FM chirp pulses, the system can achieve long range capability 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.

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.

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.

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 a 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.

The sonar head(s) may be delivered mounted on a frame together with the motion sensor and a sound speed sensor, factory aligned for ease of mounting.

All electronics are contained in the sonar head(s) which is inter-faced 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

- High resolution
- Wide frequency range
- FM chirp
- Roll and pitch stabilisation
- Yaw stabilisation with dual head
- Nearfield focusing - both on transmit and receive
- Short pulse lengths, large bandwidth
- Seabed image
- Depth rated to 50 m
- Easy to install

Options:

- Water column logging
- Water column display
- Extra detections
- Dual swath
- Dual Head



TECHNICAL SPECIFICATIONS

Frequency range	200 to 400 kHz 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)
Beam patterns	Equiangular, equidistant and high density
No. of beams per ping	400 (single swath) / 800 (dual swath) / 1600 (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

	CW pulse 200-400 kHz in 10kHz step	FM Pulse 200-400 kHz in 10kHz step
Pulse lengths	14, 27, 54, 135, 324 & 918 µs	3 & 12 ms

Physical dimensions (excluding connectors and mounting arrangements)

Component	Dimensions (WxDxH)	Weight	Depth rating
Sonar head EM 2040C MKII	332x119 (ØxH)	18.8 kg (8.4 kg in water)	Depth rating 30 m
Sonar head EM 2040CX	332x122(ØxH)	26.1 kg (17 kg in water)	Depth rating 1500 m
Processing unit (2U 19" rack)	482.5 x 424 x 88.6 mm (WxDxH)	10.5 kg	IP 22
Portable Processing Unit	370 x 390 x 101 mm (WxDxH)	10.5 kg	IP 67

Laptop, 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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