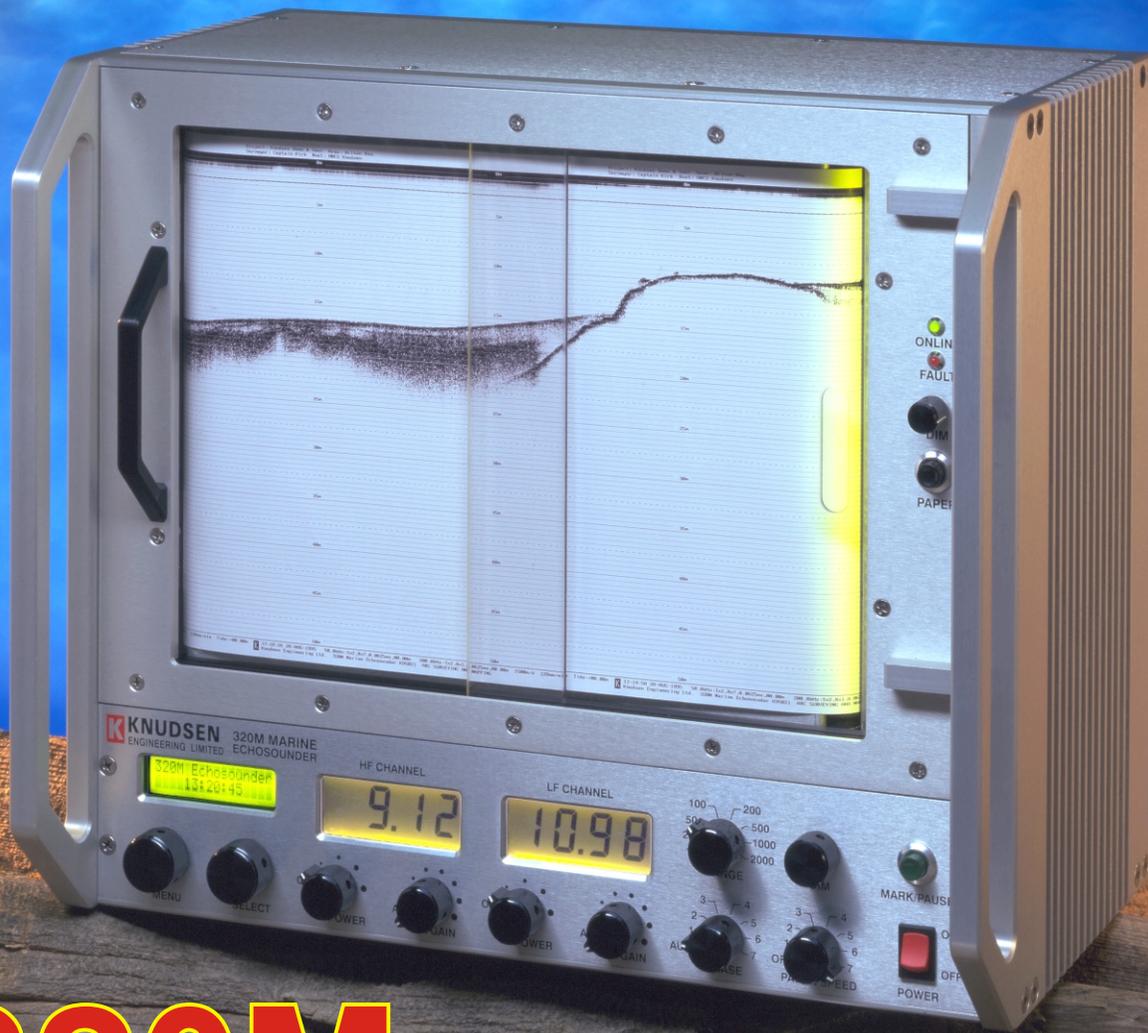


Bottom Line to Precision Sounding



320M ECHOSOUNDER

K **KNUDSEN**
ENGINEERING LIMITED

- Hydrographic Survey
- Pre and Post Dredge Operations
- Single / Dual Frequency, 3.5 to 250 kHz
- Compact, Rugged Design
- Automatic or Manual Control
- High Resolution, 32 Greyscale Printer
- Software Flexibility Ensures Product Longevity
- Interface - GPS, Heave, Datalogger, SCSI, Windows®

The 320M Marine Echosounder was developed to meet demanding requirements of field work. Its low maintenance modular construction, together with advanced features and easy configuration, make the 320M the most flexible sounder available.

Using either the high or low frequency channel, or both simultaneously, the 320M produces a high resolution record accurately depicting bottom profiles and sediment layers with 32 shades of grey. The thermal printer uses easily loaded 21.6cm (8.5") plastic film for permanent, high-quality records. The annotated depth grid is printed with reverse shading for clarity.

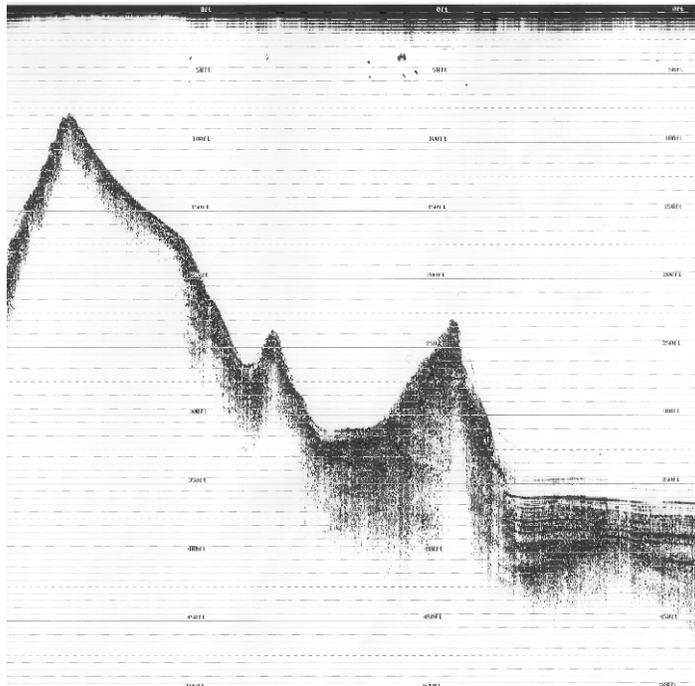
Digitized water depth is shown on two large 4-digit LCD displays, visible in direct sunlight and backlit for night operation. Serial RS-232 depth data is continuously available in NMEA format as well as user-defined string formats, and in operator-selectable time and position tagged formats.

An LCD menu display with simple 2-button control provides access to parameters such as sound velocity, draft, TX blanking, serial port assignment, time and date setting, and many more, as well as a variety of self-test, communication and configuration features. All settings are retained in non-volatile memory and recalled on power-up.

Three RS-232 ports support communication with personal computers, NMEA input and output devices, GPS receivers, sound velocity sensors, heave sensors, remote depth displays and survey dataloggers.

The standard 320M firmware includes drivers for all the devices above and can be field upgraded where firmware can be downloaded through a serial port into "flash" program memory.

In addition to traditional "hands-on" operation, an optional upgrade allows the 320M to be operated remotely through the built in SCSI interface and Windows application software.



Technical Specifications *(subject to change without notice):*

Main Ranges:	Metres, Feet or Fathoms
	10 Scale: 1 : 50
	20 1 : 100
	50 1 : 250
	100 1 : 500
	200 1 : 1000
	500 1 : 2500
	1000 1 : 5000
	2000 1 : 10000
	5000 (available via SCSI and serial only)
Phased Ranges:	Multiple 50% overlapped phases of each range (20% overlap optional), manual or automatic selection.
Paper Speed:	7 settings.
Frequencies:	3.5 kHz to 250 kHz. Standard frequencies include - 3.5, 12, 24, 28, 30, 33, 50, 200, 210 kHz.
Depth Display:	Two LCD (backlit) 4-digit displays for high and low frequency.
Power:	4 selectable levels up to 2kW on a single frequency or 1 kW on dual frequency.
Resolution:	1 cm (0-99.99), 1 dm (100-999.9), 1 m (>1000) 1/100 ft (0-99.99), 1/10 ft (100-999.9), 1 ft (>1000) 1/100 fm (0-99.99), 1/10 fm (100-999.9), 1 fm (>1000)
Record width:	20 cm (7.9") Paper width: 21.6 cm (8.5").
Sound Velocity:	1300 - 1700 m/s Resolution: 1 m/s 4265 - 5577 ft/s Resolution: 1 ft/s 710 - 929 fm/s Resolution: 1 fm/s
Clock	Internal battery backed time and date clock.
Draft:	0 - 100 m Resolution: 1 cm 0 - 328.08 ft Resolution: 0.01 ft 0 - 54.68 fm Resolution: 0.01 fm
Annotation:	Internal: date, time, GPS position. External: from RS-232 port.
Pulse Length:	Automatically selected, with operator override.
Printer:	Self-test, manual or automatic contrast, high resolution of 1600 pixels per line in a 32 step grey scale, LED status indicators, paper advance control.
Gain Controls:	AGC, TVG and manual receive gain for each frequency.
TX Blanking:	0 - 300 m. Resolution: 0.1 m 0 - 984.3 ft. Resolution: 0.1 ft 0 - 164.0 fm Resolution: 0.1 fm
Serial Ports:	Three RS-232 ports, 300-38,400 baud, optional RS-422.
SCSI Port:	Standard, 50 pin Centronix (SCSI communications for 320M only available by purchasing the optional SCSI upgrade kit) <i>Note:</i> Contact manufacturer for PC requirements.
Heave:	TSS and Seatex compatible.
Position:	Compatible with all popular GPS receivers.
Power Supply:	12 to 36 VDC. 85 - 240 VAC adaptor available.
Installation:	Bulkhead or 19" rack mountable. Includes custom Hardigg case.
Dimensions:	W 419 x H 355 x D 241 mm. (16.5" x 14" x 9.5")
Weight:	19 kg. (42 lb)
Units:	Metres, Feet or Fathoms
Options:	Windows SCSI SounderSuite Software Custom stand Single frequency (upgradeable to dual frequency) Transducer multiplexer Transducers (many are available) Transducer 'over the side' mounting brackets Rackmount brackets Remote Display