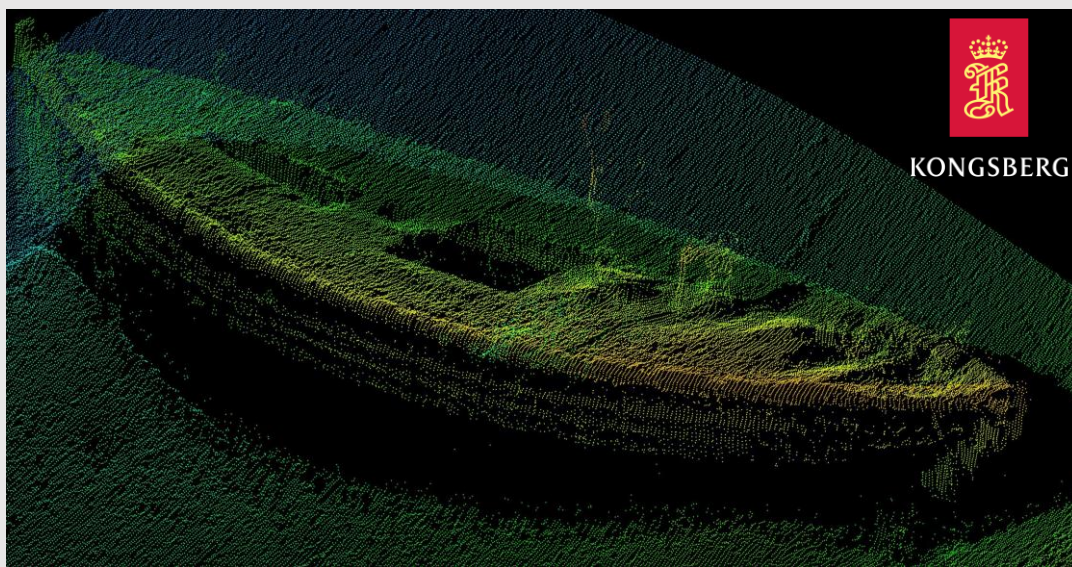




KONGSBERG



APPLICATION NOTE

EM 2040 HIGH FREQUENCY MAPPING

600 kHz AND 700 kHz MODES FOR INSPECTION AND MAPPING

700 kHz providing $0.225^\circ \times 0.45^\circ$ beamwidths

600 kHz normal mode maintains efficient area surveying with 100° coverage and up to 120° available

Large operational range with 3 depth modes providing more than 40 metres range at high resolution

Available as a licensed software upgrade for existing and new EM 2040 and EM 2040P systems

EM 2040 HIGH FREQUENCY SOFTWARE UPGRADE

High frequency upgrade option for EM 2040 and EM 2040P

The EM 2040 was the first 3-sector broadband multibeam echo sounder in the market, originally designated as a 200 – 400 kHz system. The same system now offers a 600-700 kHz upgrade option providing unrivalled beamwidths whilst still maintaining survey efficiency.

Although generally understood that the frequency and length of any array govern the resolution, users can only increase the frequency to a set point before either hardware or physical constraints are a problem; if the frequency is achieved, the effect of grating lobes will restrict the swath width.

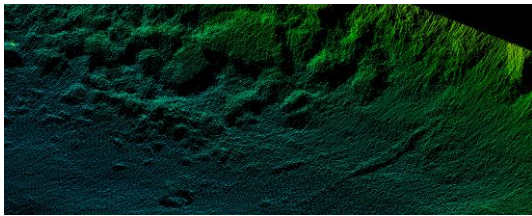
As a result, any market offerings until now have provided a high frequency inspection mode with a detrimentally restricted swath width. Kongsberg Maritime's new software upgrade overcomes both of these constraints by providing operators with two new modes allowing clarity and efficiency never before realized in the shallow water mapping sector.

600 kHz Wide Area High Frequency Mapping

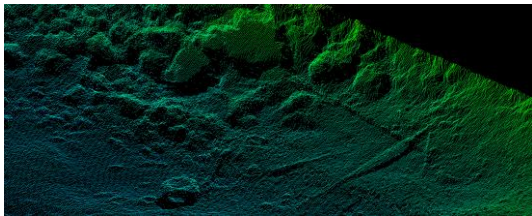
The 600 kHz negates grating lobes from traditional systems by using the sector transmission with 100° coverage and up to 120° available allowing doubling resolution with little sacrifice in efficiency over the standard 400 kHz mode. Three depth modes allow ranges from less than 5 metres through to in excess of 40 metres allowing IHO Special Order requirements to be met within the one 600 kHz mode.

700 kHz Cable and Pipeline Inspection

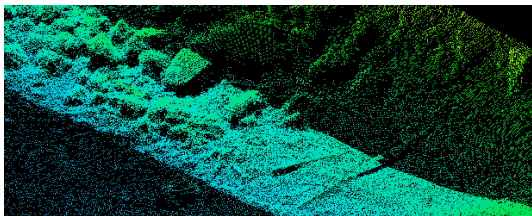
The 700 kHz option provides the highest resolution available contained within a narrow 30° coverage. Designed for cable route surveys where single pass is required the user focuses all sounding into the narrow spread, an ideal solution for AUV and ROV.



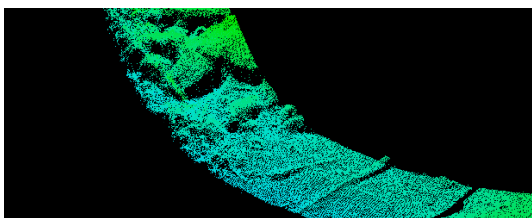
400 kHz



600 kHz



700 kHz Overlaid



700 kHz

Compatibility and Flexibility

Using KONGSBERG's unique sector transmission this upgrade option is available for both standard EM 2040 and the EM 2040P, more than doubling each system's respective angular resolution. In addition to the improved resolution the option also provides compatibility with extra options such as Extra Detections and Water Column logging.

TECHNICAL DATA

EM 2040

Beamwidth:

	0.4° TX	0.7° TX
700 kHz:	0.225° x 0.45°	0.45° x 0.45°
600 kHz:	0.25° x 0.5°	0.5° x 0.5°

Coverage: 100° nominal coverage in 600 kHz with 120° available, 30° with 700 kHz mode

Range: 3 pulse modes 5 – 40 metres+

EM 2040P

Beamwidth: 700 kHz: 0.6° x 0.6°
600 kHz: 0.65° x 0.65°

Coverage: 100° nominal coverage in 600 kHz with 120° available, 30° with 700 kHz mode

Range: 3 pulse modes 5 – 40 metres+

*The high frequency options are only available for single receiver systems. Options **not** available for EM 2040C*

