



## EA440

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### NEW GENERATION WIDE BAND HYDROGRAPHIC ECHO SOUNDER 10-500 kHz

The EA440 is a new hydrographic multi frequency echo sounder with wide band technology. The EA440 has been developed for use in shallow to medium depth waters. It supports both portable and hull-mounted side scan, and sub-bottom light for shallow waters. The operating software is in accordance with the new KONGSBERG standard MMI and it has an easy and intuitive user interface with extensive display capabilities.

#### **Ease of operation**

The EA440 echo sounder utilises the Microsoft Windows® 7 operating system, providing users with maximum flexibility and ease of operation. It can be operated by mouse, track ball or via user-defined shortcuts. The following languages are available: English, German, French, Icelandic, Norwegian and Spanish.

#### **Customisable display screen presentation**

The display picture can be customised to suit your individual requirements. You can select from different windows on the screen such as echogram, A-scope, sidescan, digital depth or echoscope. Many functions within the EA440 system can be controlled with a simple click, including comprehensive context sensitive on-line help. Save your favourite settings and call them back when you need them.

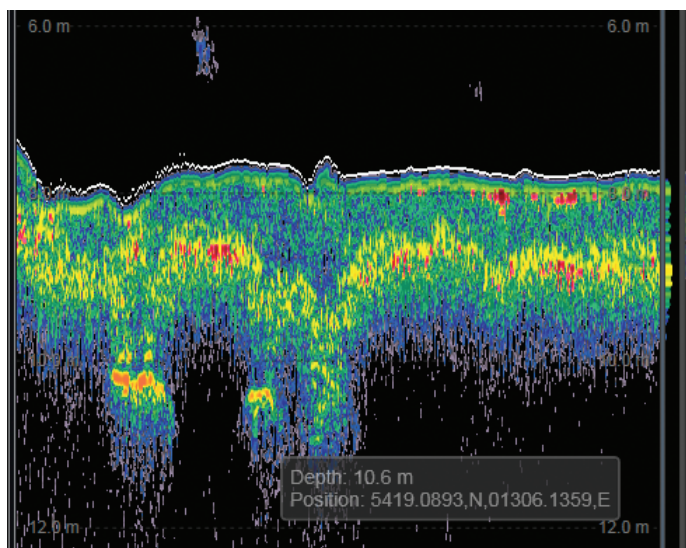
#### **Multiple frequencies**

Up to eight high-power transceiver channels can be operated simultaneously from the EA440. For improved performance the transceivers are installed close to the transducers and linked to the combined display and processor via a single ethernet cable. The frequencies available range from 10 to 500 kHz.

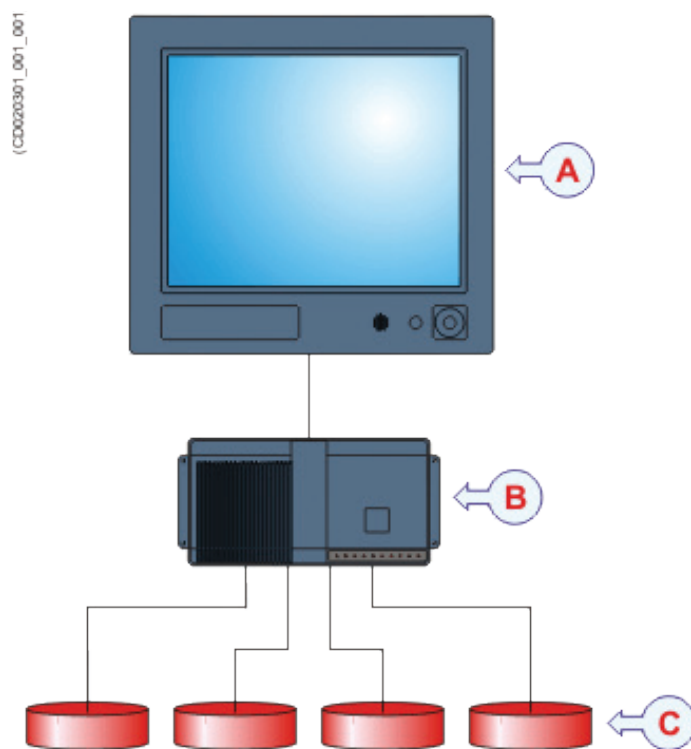
A variety of highly efficient transducers are available to suit all of your operational needs, from extreme shallow (0.2m) down to 3000 m water depths, as well as side-scan applications. Low frequency transducers (typically 10 and 15 kHz) may be supplied for sub-bottom light but with a maximum depth range of 300 m. The complete EA440 system consists of a Windows 7 PC, wide band transceiver(s) and up to eight transducer units.

## EA440 KEY FEATURES

- Microsoft Windows® 7 operating system
- Frequencies ranging from 10 - 500 kHz, wide band
- CW and FM pulse forms for a good signal to noise rate (S/N). This is especially important for high resolution long range sidescan
- Easy operation
- Up to 8 simultaneous channels/frequencies
- Transducers ranging from 10 W to 1 kW with frequencies ranging from 30 - 500 kHz
- Zoom function in echograms for vertical/sidescan channel
- Echograms can be stored as Bitmap files and/or printed directly
- Logging of all raw data for each ping, including annotation, navigation and other sensor information in chosen directories
- Replay mode of stored raw sample data for advanced post-processing and visualisation
- Ability to save favourites and individual settings
- Flexible sensor interface
- Supports GPS, speed log, temperature, gyro compass, motion and SV probe sensors
- External annotations
- Roll, pitch and heave compensation
- A wide range of sound velocity options ranging from manual constant to real time probe
- Advanced algorithm for bottom detection communication
- Flexible mounting options with different PC configurations
- Integrated high resolution side scan functionality, for example with 2 transducers (Port/Starboard)
- Output of markers for selected side scan objects for use in external software
- Support for a large range of output data formats
- High resolution due to sample rates from 0,6 cm at 500 kHz
- Light sub-bottom functionality for 10 kHz and 15 kHz
- Extensive data in-/output formats for external communication

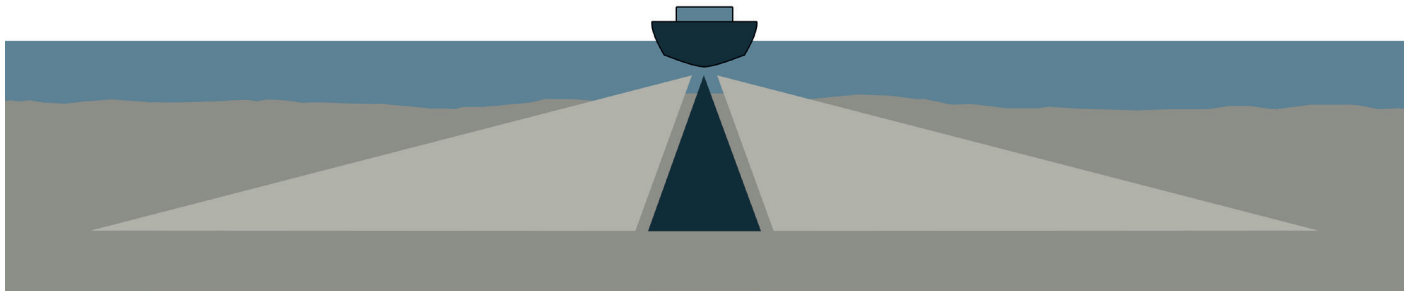


Echogram with 15 kHz, CW Pulse, 2,5m sub-bottom (Düker)



- A. Hydrographic Operator Station (panel computer with integrated display)  
 B. Transceiver Unit (Wide Band Transceiver (WBT))  
 C. Transducer(s)

# EA440 SIDESCAN FUNCTION



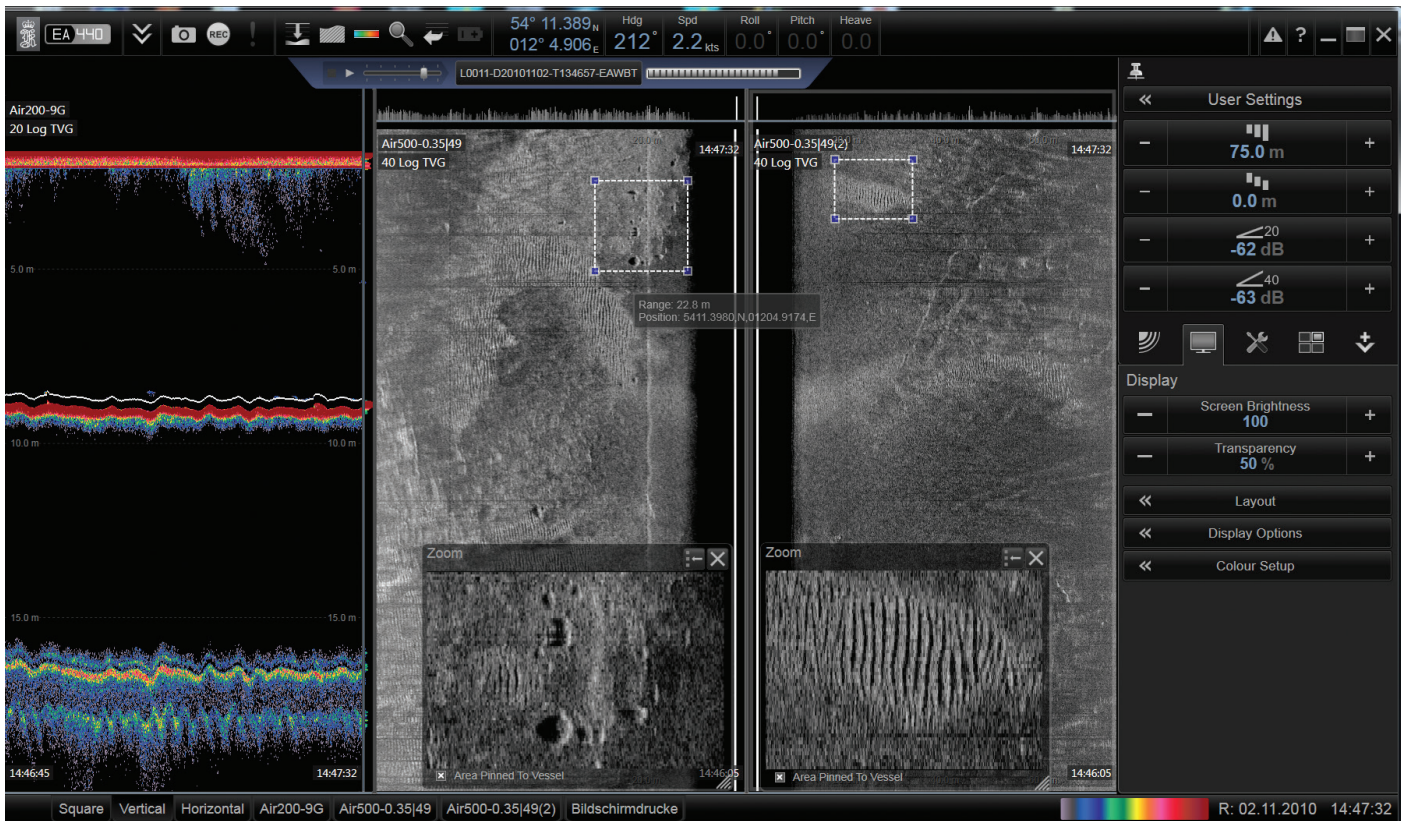
The EA440 high resolution sidescan function is well suited for:

- Object detection
- Morphology of bottom
- Dredging control
- Obstacle and wreck detection

Objects in the side-scan view can be marked by a mouse click and the position information will be stored. This data can then be exported real time to external software if connected to a GPS positioning and heading device.

With an extra zoom function interesting targets or objects can be scaled up for detailed inspection. The zoom area is freely adjustable and the window can be positioned as an overlay on any part of the side-scan echogram.

FM chirp is a powerful tool for high frequency high resolution side scan. A 500 kHz side scan with a CWC of 32  $\mu$ s gives high resolution but short range, typically 50 - 75 m. Switching to a 1 ms FM chirp will increase the range to typically 125 - 150 m, while keeping the resolution. There is no longer any need to sacrifice resolution for range.



1 vertical channel 200kHz, Dual Side-scan 500kHz with zoom area for inspection of objects (left) and morphology (right)

# TECHNICAL SPECIFICATIONS

## SYSTEM

The EA440 Software runs on a standard Windows 7 PC and is simple to install. To access online help, Microsoft Internet Explorer is mandatory.

- Operator system: Windows 7
- Hard disc min. requirement: 100 GB
- Languages: English, German, French, Icelandic, Norwegian, Spanish
- Display range min/max.: 1 – 12.500 m
- Manual, auto range /auto start
- Views: echogram, side scan, scope

## COLOUR DISPLAY

- Display of actual pings in 12/ 64 colours, grey scale, copper, Colour threshold and range free selectable (in dB)
- Depth resolution: 1 cm
- Pulse forms: CW, FM Chirp
- Minimum sample rate:
  - 0,6 cm (200 & 500 kHz)
  - 2 cm at 50/70/120 kHz
  - 5 cm at 38 kHz
  - 10 cm at 15 kHz

## EXTERNAL INTERFACES

Serial and network for raw data, navigation data in NMEA, annotation and motion sensor, output of depth in SIMRAD, Atlas, HYMAS and NMEA format, Remote Start/Stop logging, Event annotation, NMEA temperature-input.

## SOUND VELOCITY

Manual, calculated or variable from imported profile file, online correction with temperature sensor and salinity setting

## BOTTOM DETECTION

Advanced software algorithm for bottom detection with selectable min/max depth ranges and adjustable threshold settings in dB.

Ping rate: Max. 20 pings per second (adjustable)

## DATA STORAGE

Complete echo sample raw data, bitmaps, echogram data, XTF, XYZ and position data formats can be stored on internal/ external medium

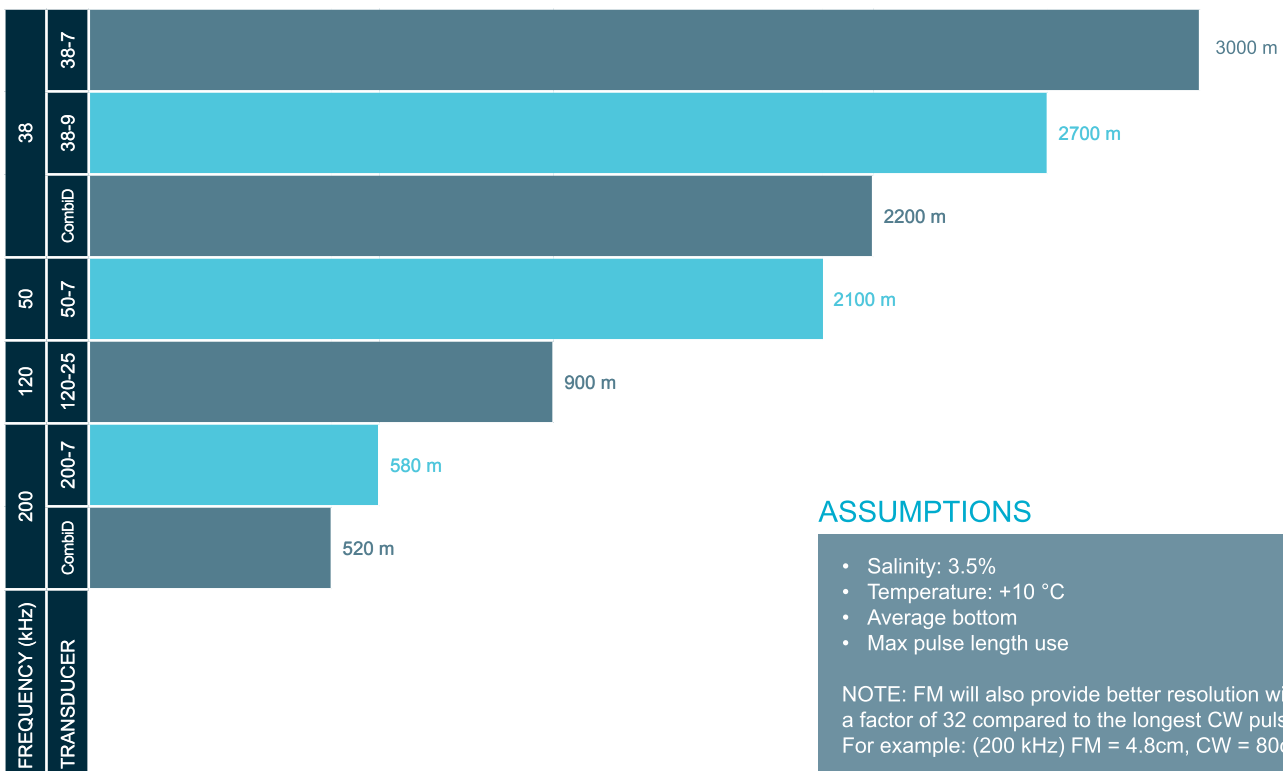
## TRANSCEIVER UNIT

- Frequency range: 10-500 kHz
- Channels: up to 8 frequencies simultaneously
- Transmitt power: 10 W to 650 W
- Receiver: 160 dB dynamic range
- Power: 12-15 VDC
- Consumption: max. 5A
- Temperature range: Operation 0-50°C, Storage -40/+70°C

## WEIGHTS AND OUTLINE DIMENSIONS

- Height: 84 mm
- Depth: 213 mm
- Width: 438 mm
- Weight: 5 kg

## EA440 CALCULATED DETECTION DEPTHS WITH FM PULSE



## ASSUMPTIONS

- Salinity: 3.5%
- Temperature: +10 °C
- Average bottom
- Max pulse length use

NOTE: FM will also provide better resolution with a factor of 32 compared to the longest CW pulse. For example: (200 kHz) FM = 4.8cm, CW = 80cm

Specifications subject to change without any further notice.

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