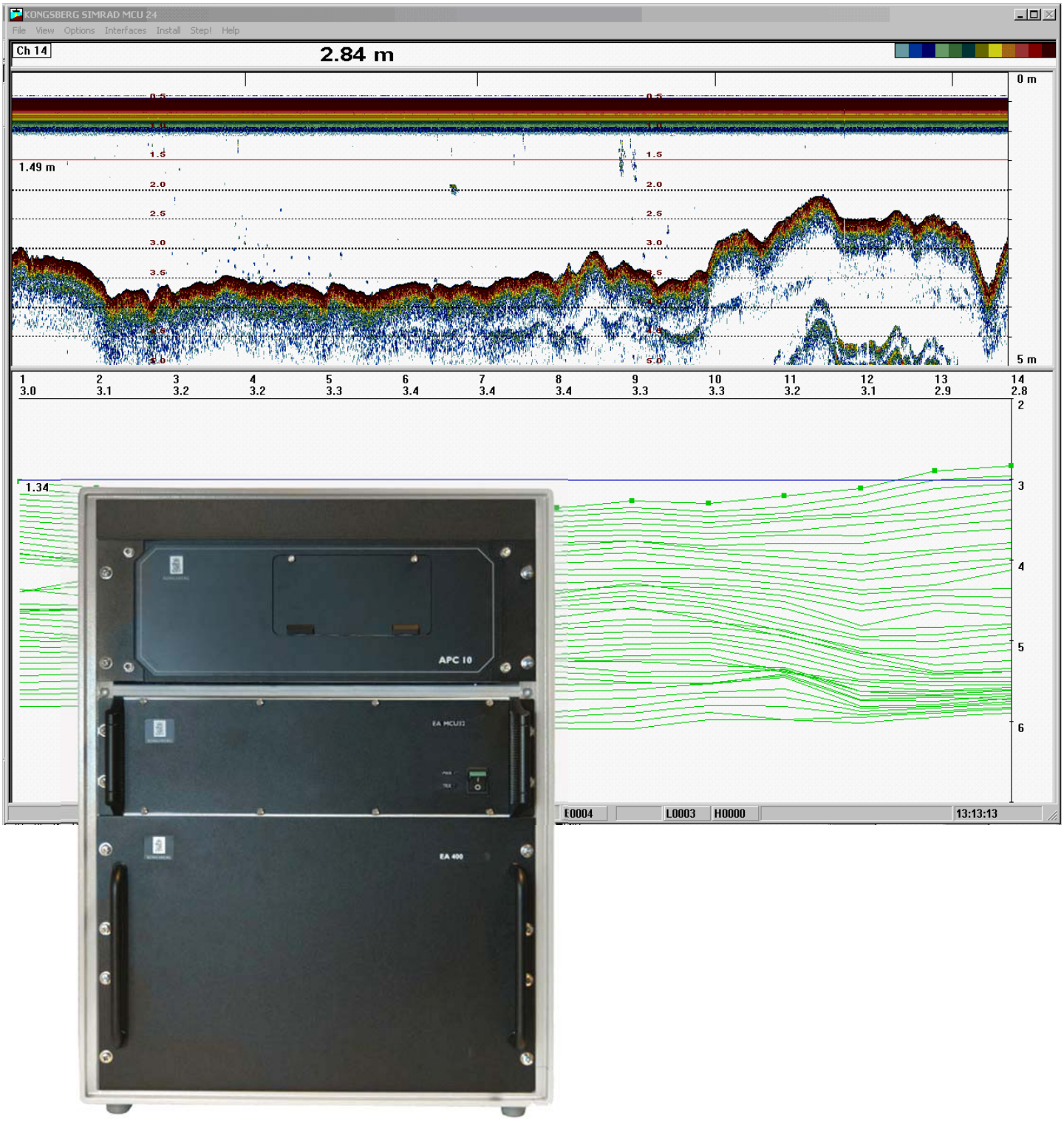
Hydrographic sweep system

KONGSBERG

New precision hydrographic sweep system for shallow water



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The EA MCU32 is a hydrographic sweep system specifically designed for use in canals, rivers and other shallow bodies of water. Its precise depth and bottom detection capabilities provide detailed bottom imagery.

This compact multichannel echo sounder, based on windows XP software, can simultaneously monitor both depth and bottom profile. All data is shown in real time using a colour-coded waterfall display which graphically represents areas of common depth using different colours. A minimum depth parameter can also be entered as a visual shallow-water warning (waterfall display data under the specified minimum depth parameter will be colour-coded red).

The EA MCU32 readily detects obstacles and objects on the bottom. Even when targets are covered by mud or sediment, spikes in the waterfall display and abrupt changes in baseline echogram data disclose their locations. By using 15 kHz low frequency simultaneously, sub-bottom penetration data is achieved.

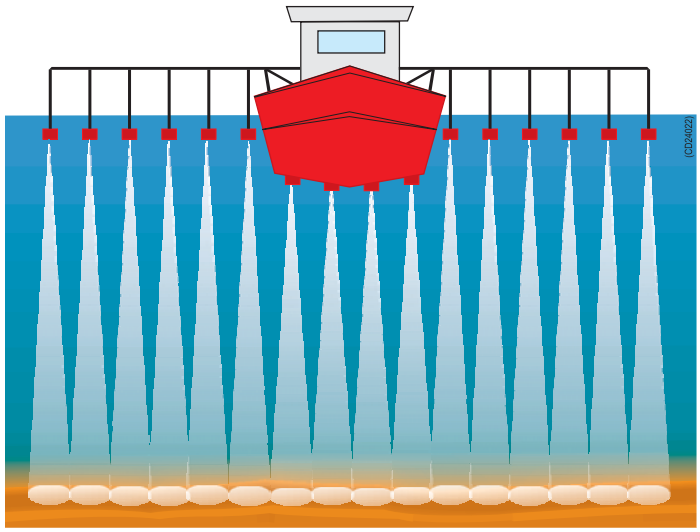
The display view can be split into "n" echograms (dependent of number of installed transducers) for quality use.

Primary features

The EA MCU32 sweep system has several advantages including:

- Bottom detection capabilities specially suited for use in shallow water.
- Consistent and accurate data over an entire sweep.
- Replay of raw data.
- Is simple to configure the x,y and z coordinates of the transducers.

A safe located and retrieved using an EA MCU.



EA MCU32 using a 16 channel configuration.

- Transducer mode, parameter and display settings, to be stored in the computer's hard drive.
- Storing of real time sound velocity (SVP) smart sensor

A variety of uses

Primary applications for the EA MCU32 sweep system include detailed bottom surveying of canals, rivers and other inland or coastwise bodies of shallow water with depths from 0.5 meters. The EA MCU32 sweep system provides the means for:

- Detecting and locating debris or other hazards to navigation in harbors, rivers or canals so that they may be removed.
- Monitoring the charted safe depth of navigable waterways.
- Surveying shallow inland bodies of water, estuaries, marsh or tidal areas.
- Monitoring dredging or underwater construction operations.
- Monitoring silt build-up or shifting bottom topography for commercial or environmental studies.

System hardware

The system's hardware is based on proven EA 400 GPT technology, a computer equipped with network interface for communication with MCU32 unit and GPT and a designed multi-channel unit incorporating 32 relays. All necessary components can easily be mounted in a 19 inch rack to save space.

The high frequency transducers provide a 7° beam pattern at -3dB (approximately 11° at -6 dB). The system's bottom coverage is dependent on both the

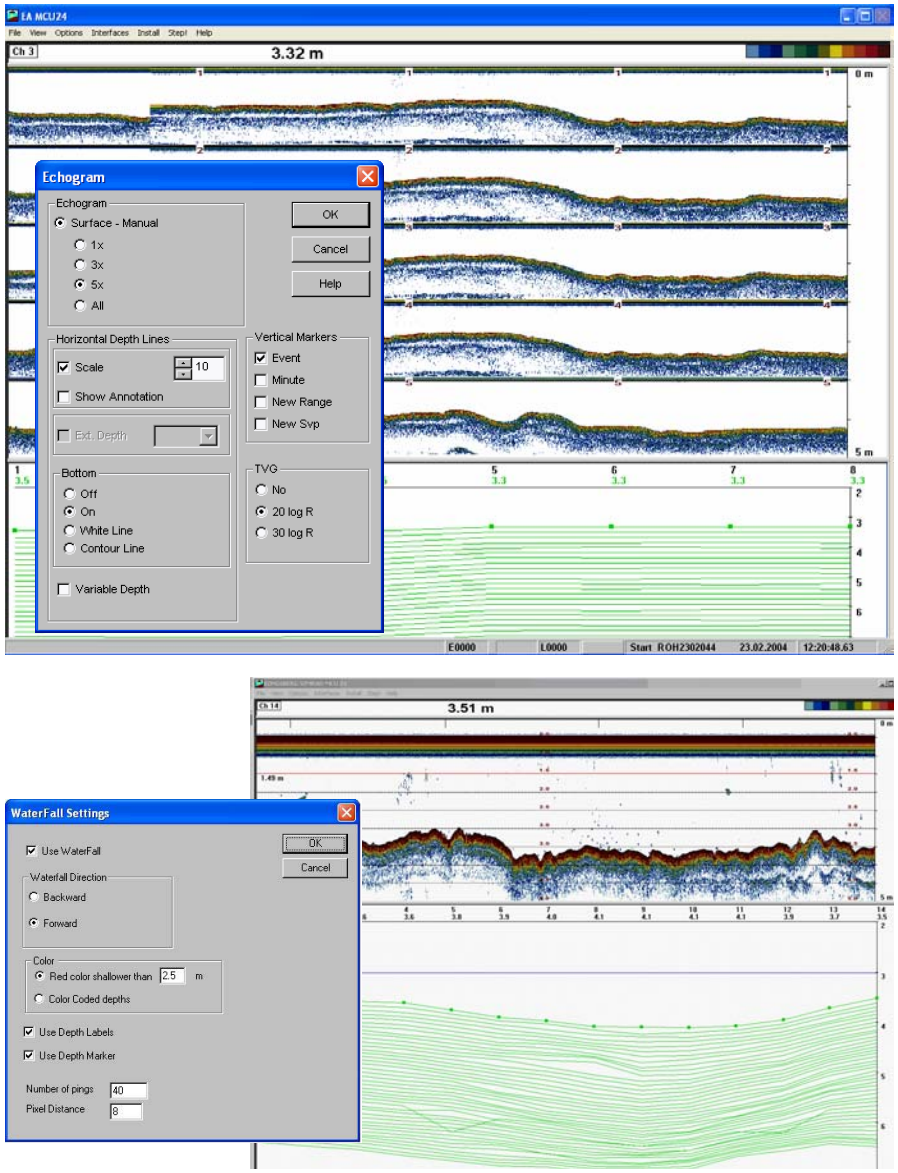
water's depth as well as the distance between each transducer. For example, to achieve total bottom coverage at a depth of 4 m, the transducers must be located 0.5 m apart from each other.

The system can also handle low frequency (15 kHz) simultaneously with high frequencies. The 15 kHz transducer provide a 17º beamwidth at -3 dB. (Approximately 23º at -6 dB.)

System software

The computer used to operate the EA MCU24 system uses Windows XP® based software to:

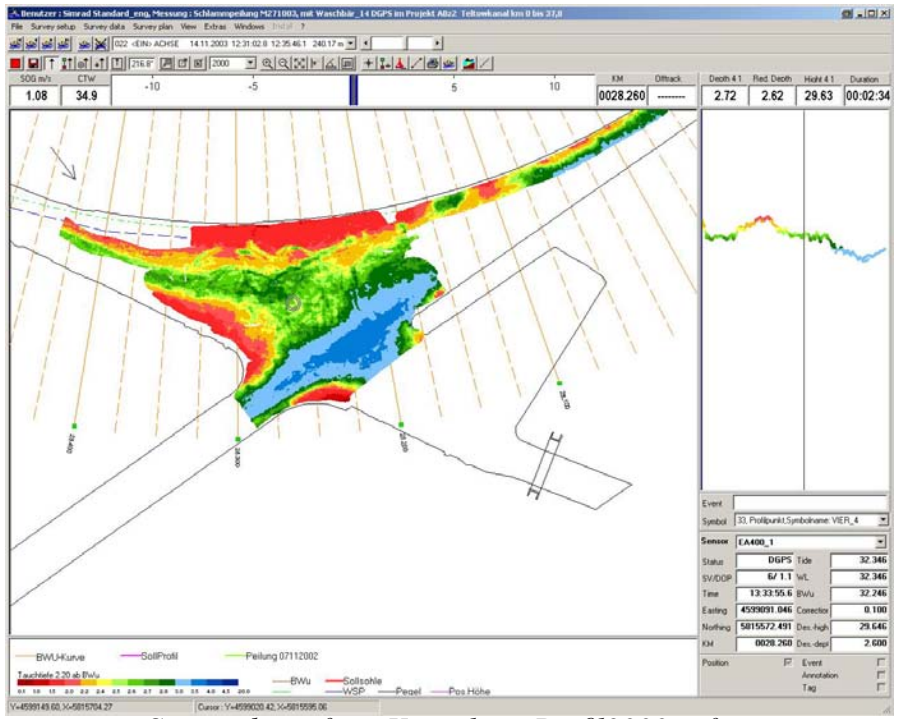
- Provide input of MRU and navigation information.
- Provide input of SV data. (Constant or real time from smart sensor.)
- Store and retrieve data, for example for replay, using a memory device.
- Allow EA MCU32 and third party survey software to be run simultaneously on the same computer.
- Interface depth data with a serial network (socket), for example so that it may be accessed by other survey software.



User interface for EA MCU32 software and echogram waterfalls.

Survey software

While sweeping, depth data can be simultaneously exported through a network (socket) to Kongsberg **Profil2000** survey software running on the same computer used for post-processing data collection. This provides an extremely detailed image of the bottom.



Screen dump from Kongsberg Profil2000 software.

EA MCU32 sweep survey system

Display echogram range:
- Minimum ..... 1 m
- Maximum..... 15000 m
- Modes ..... Manual

Display waterfall range:
- Minimum ..... -5 m
- Maximum..... 15000 m
- Echogram-modes ... 1x-3x-5x-all view and waterfall
- Waterfall direction ..... Forward or backward

Ping rate (survey mode) .....
Max 30 Hz (dep. on CPU speed/number of GPTs)
Measurement resolution.....1 cm
Measurement accuracy (with correct sound velocity):
- 15 kHz.....10 cm
- 120 kHz.....2 cm
- 200 kHz and 710kHz .....1 cm

Variable sound velocity..... 1400 to 1700 m/sec
Language..... English (Other languages on request)

Minimum specification PC

- Pentium M ..... 1 GHz
- Internal RAM..... 256 MB
- Display resolution..... 1280 x 1024 pixels
- Operating system ..... Windows 2000/XP
- Minimum hard disk size ..... 40 GB
- CD ROM..... Read/Write

Interface

Data output (NMEA 0183) serial line or ethernet:
• Simrad D#
• $--DBS, $--DBT and $--DPT NMEA formats
• HYMAS (max 20 depths)

Data input (NMEA 0183) serial line or ethernet:
• Latitude and longitude from GPS (DGPS)
• Any format on serial line (ASCII)
• Motion sensor data
• Sound velocity profile data
• Real time SVP smart sensoer.

Annotations

• Event marker operated from menu, by remote toggle switch or serial
• Ethernet

Data storage

• Raw data

Multi Channel Unit 32 (MCU)

- 24 Vdc double centre zero relay, double pole and double throw. The relay it self can be changed.
- Service life mechanical $3x10^7$, AgNi contact material
- Digital controller unit, up to 32 channels
- Ethernet bus coupler
- Power supply, 24 Vdc 2 A for ethernet I/O

Connectors:
Network RJ45
Nipples for transducer cables and GPT cables

Supply power:
Main power supply 115 Vac or 230 Vac input.
- Operation temperature ..... 0 to +55 deg C
- Storage temperature.....–40 to +70 deg C
- Humidity .....5 to 95% relative non-condensing

General Purpose Transceiver (GPT)

Operating frequencies:
- Up to 5 GPT's /10 frequencies

Single beam frequencies:
- 15 120, 200 or 710 kHz (Options on request.)

Power output, standard transducers:
- All frequencies..... Variable up to 100W
- 15 kHz.....1000W

Supply voltage:
- 95 to 265 Vac, 50/60Hz or 12 Vdc, 100 W

Operation temperature ..... 0 to +55 deg C
Storage temperature .....–40 to +70 deg C
Humidity .....5 to 95% relative non-condensing

Physical dimensions

EA multi-channel unit (MCU24):
- Height .....132.8 mm (3U)
- Depth included grip ..... 386 mm
- Width .....461.9 mm(19 inch rack)
- Weight (approximately) 5kg

GPT single or dual frequencies:
- Height ..... 112 mm
- Depth ..... 246 mm
- Width ..... 284 mm
- Weight (approximately) .....5 kg

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