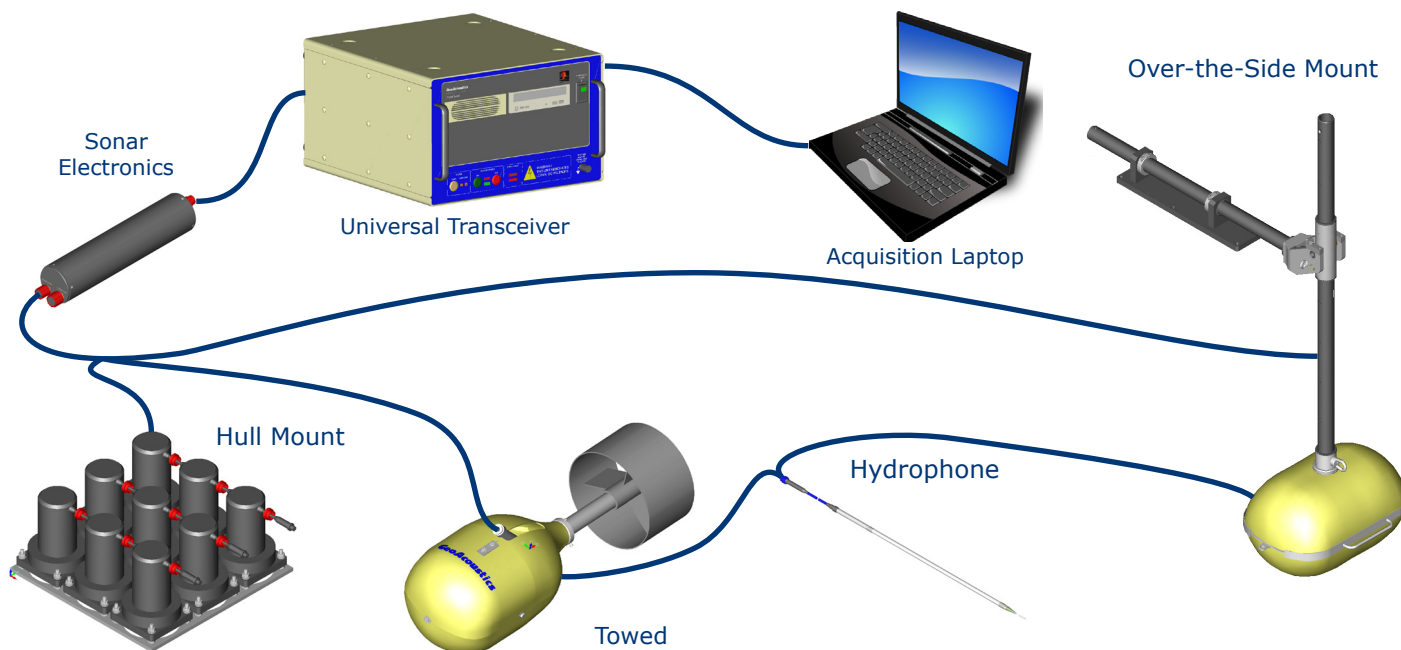


GEPULSE PLUS



KONGSBERG



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DIGITAL CHIRP SUB-BOTTOM PROFILER WITH VERSATILE DEPLOYMENT OPTIONS

GeoPulse Plus is a digital sub-bottom profiler. Depending on the survey task the user can choose waveforms in the frequency band of 1.5 - 18kHz optimising resolution and sub-seafloor penetration. A range of mounting options are available ranging from fixed installations on dedicated survey vessels, to towed systems and portable mounts on vessels of opportunity.

Technology

GeoPulse Plus is a technically advanced sub-bottom profiling system. Its digital processing and waveform selection technology enables the appropriate pulse-shape, power signature and configuration to be selected for the job in hand, whether it's mapping the geology in deep oceans or determining mud thickness in a silted harbour. Traditional sub bottom profilers utilise single frequency fixed length "pinger" type pulses, which reflect from sub sea layers to map the morphology. With the advent of chirp technology and advances in digital processing techniques in the 1990s the science took a step forward with frequency modulated pulses - waveforms that encompass a range of frequencies. The new GeoPulse Plus system combines the best features of both these technologies and adds higher transmit power combined with digitisation of the return signals at source. Massive over-sampling of the received signals provides high resolution 24 bit data.

System Components

The system is operated directly from the deck unit or a laptop computer, which interfaces to the deck unit via Ethernet. The sonar electronics are mounted close to the transducers in all deployment options and the signal is transmitted to the deck unit via a lossless digital connection. Data is acquired with the transmit transducers or alternatively with a hydrophone,

allowing operations in very shallow waters using chirp source signatures.

Universal Transceiver

The Universal Deck Unit is PC based with a monitor and keyboard/mouse to allow easy operation of system set up. Once up and running the system can be controlled using standard industry software.

Sub-Sea Electronics

The waterproof electronics module is manufactured in aluminium (stainless steel optional) and is rated to 2000 metres (6,562') water depth. Its internal memory stores the required waveforms, and it utilises a super efficient HV transmitter to deliver high power to the transducers. The return signals received either from the trailing hydrophone or from the transducers are instantly digitised prior to being routed to the Universal Transceiver via a local Ethernet connection or on longer cables via an ADSL link.

Transducers and Hydrophone

The T135 transducers are each rated to an output of 2.5kW and operate efficiently over a wide frequency band of 1.5 - 18 kHz. The trailing single channel hydrophone utilises 8 high-spec elements to capture the return signal and route it via an inline pre-amp to the subsea electronics where it is digitised.

Transducer Deployment Options

Deployment options

Over-The-Side-Mount

Ideal for small vessel operations the OTS version utilises an easy to deploy pole and associated universal mounting kit. The transducers are housed in a hydrodynamic pod.

Towed Transducer Vehicle

The Towfish is a proven design and is suitable for towing in deep or shallow waters. The rugged galvanised body and strong fibreglass carapace provide added protection for the

transducers and electronics housing while the receive hydrophone is trailed behind. Towfish deployment requires a steel armoured tow cable

Hull mounting

The transducers can be mounted in a sea chest either inside the ship's hull or in a purpose made gondola. The array is usually configured with a total of 4, 9 or 16 transducers. The larger arrays give a narrower beamwidth and are therefore more suitable to deep water applications.

FEATURES

- 1.5 - 18 kHz Sub-Bottom profiler
- 24 bit dynamic range, no AGC or TVG during acquisition
- 40 MHz raw data sampling, improved data quality
- Wide bandwidth robust digital data transmission
- Versatile hull mount, over-the-side mount and towed options

PERFORMANCE

- Penetration (typical)
 - clay 80 m
 - coarse sand 6 m
- Resolution
 - 6 cm source sweep dependant

TECHNICAL SPECIFICATIONS

Deck Unit - Universal Transceiver

General

- Power requirements: 110-230VAC selectable input, 50-60 Hz, 200W
- Size: 42.8cm W x 49.7cm D x 27.5 cm H.
- Weight: 26.3 kg.
- Temperature: Storage: -20 to 75°C.
- Operating: -5 to 50°C.
- Humidity: 10% to 95% RH, non-condensing.
- Mounting: The unit is suitable for either bench or rack mounting.
- PC Hardware
 - Processor: 3GHz Intel® Core™ 2 Duo processor.
 - Operating System: Windows® XP Professional (32bit)
 - Hard drive: ≥320GB SATAII
 - Memory: 4GB DDR2.
 - Optical: Dual Layer DVD±RW.
 - Graphics: NVIDIA® 8500GT 256MB
- Rear Panel connectors
 - Video: DVI-D and D-Sub.
 - USB, Ethernet, Audio and Parallel.
 - BNC: PPS
 - 4 x RS232 ports
 - Amphenol: MS3102A-22-34S for deck cable.
- Sub-Bottom-Profiler Transmit
- Frequency Range: 1.5 to 18 kHz programmable
- Power Output: 10 W to > 4 kW user programmable
- Source Level: up to 205dB ±3dB re 1uPa@1m
- Receiver sensitivity: -205dB ±3dB re 1V/uPa
- Programmable source signatures:

- pinger, variable number of cycles and frequency
 - frequency modulated (chirp) variable envelope and frequency functions
- Pulse Repetition Rate: 4 pulses per second maximum for 32ms chirp sweep 10 pulses per second for pinger waveforms
- Efficiency: Greater than 90%
- Transmit Transducers: 4 x T135 Wideband
- Digital Cable link
- Data Rate: 6-25 Mbits/s
- Cable length: 0-6000m

Sub-Sea Electronics

- Dimensions: 545 mm L x 125 mm D
- Weight: 11 kg in air, 6 kg in water
- Depth rating: 2000 m to 4000 m (optional)

Transducer (Model T135)

- Dimensions: 184 mm x 184 mm x 267 mm H
- Weight: 11kg in air, 6 kg in water

Tow fish

- Tow speed: 1 to 12 kn.
- Weight: 125 kg
- Dimension: 156 cm (L) x 46 cm (W) x 46 cm (H)

Over-the-side mount assembly

- Dimensions: 70 cm (L) x 52 cm (W) x 46 cm (H)
- Mounting Staff: One section 183 cm, two sections 360 cm
- Weight: 120 kg

Hull mount

- 2 x 2 (4), 3 x 3 (9) and 4 x 4 (16) transducer arrays available
- Bespoke sea chest deployment

Specifications subject to change without any further notice.

KONGSBERG GEOACOUSTICS LTD

Great Yarmouth, UK

km.geoacoustics.sales@kongsberg.com

+44 1493 600666

www.km.kongsberg.com/geoacoustics



KONGSBERG