

Benefits

- Reduces costs associated with multiple survey passes
- Reduces costs associated with using multiple sonar over the same target
- Generates multiple images at different acoustic parameters and processing filters
- Obtain more comprehensive awareness of underwater environment
- Improve resolution of target being imaged
- Reduces risk of capturing bad quality data
- Ideal for autonomous applications

Applications

- Multi Spectral Pipeline Survey
- Scour and Tidal Flow Analysis
- Bubble/Gas Monitoring
- Diver Tracking
- Marine Construction Asset Placement



Multiple Simultaneously Processed Images with Multiple 3D Data Windows

PIPE Sequencer is a paid module within 4G USE® for Echoscope PIPE® Sonars that permits the configuration and viewing of multiple real-time 3D Data Sets.

PIPE Sequencer allows users to configure and capture for their underwater environment a sequence of up to ten (10) sets of real-time 3D Data sets and 3D Data Views using different acoustic and processing parameters such as frequency range, pulse length, TVG, transmit and receive gain or other processing parameters such as filters, bottom detection methods or sidelobe clip levels. This allows a single system to capture substantially higher quality data pertaining to its underwater environment than would be possible with a conventional sonar in a single configuration.

PIPE Sequencer also allows the user to open multiple 3D Data Windows in the software and view the various multiple 3D Data captured from different angles, thereby given more complete understanding of the underwater target/structure being imaged.

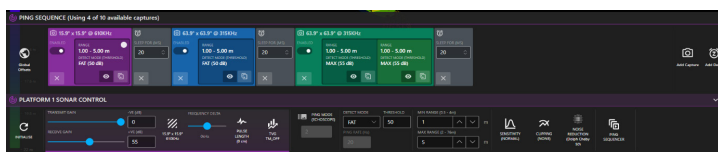


Figure showing Software Interface (Capture Cards with Sonar Acquisition Parameters)

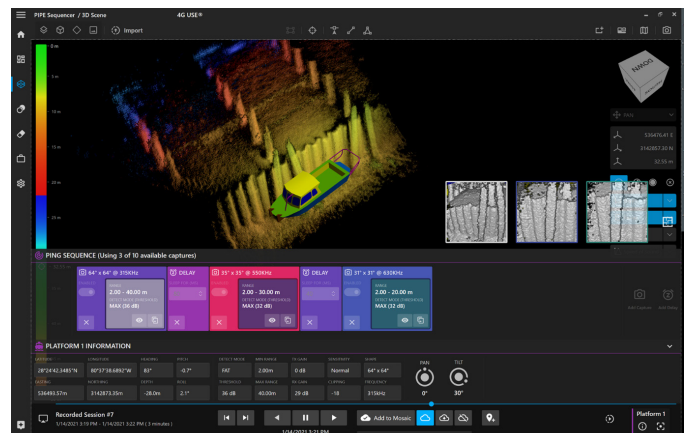


Figure showing Software Interface (Capture Cards and Capture Views) with 3 (of the 10 available) different 3D Acquisition Sets (315kHz, 560kHz, and 630kHz) rendered in a single consolidated 3D View

Features

Ability to create a sequence of up to 10 different parameter sets for acoustic capture and processing including different frequencies allowing hands free operation for different processing requirements in a single sonar system

Ability to swap configuration sets instantly ping-to-ping to achieve dynamic frequency, field of view and other capture and processing functions

Multiple real-time 4D images with different capture and process parameters which can be accessed and displayed in independent views of the survey operations in real-time

Replicate capability of running the same survey line at different frequencies or imaging parameters; or if multiple sonars were running simultaneously

Parallel Processing and Display of Real Time Images

Sequential Processing and Display of Real Time Images

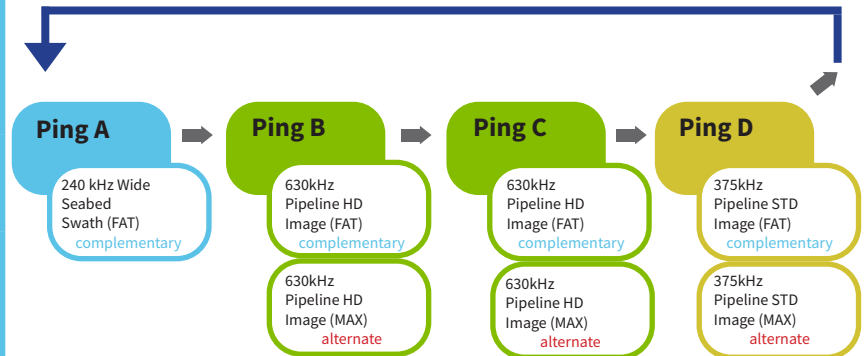
Availability of Full Time Series 3D Backscatter Range and Intensity Data comprising up to 40 million data points per acoustic ping (128x128x2,500)

FAT and MAX images now can be generated from a single ping

Set acoustic Capture to address Transmit Frequency, Transmit Ping Shape, Transmit Pulse Length, Transmit and Receiver Gain Levels and Time Varying Gain (TVG)

Set the following processing and filtering parameters: Beam Detection (MAX and FAT), Threshold, Minimum and Maximum range, Noise Reduction, Sensitivity, Sidelobe Clipping, and Ping Rate

Example Application: Pipeline Survey



In the example above, a sequence is defined allowing the user to obtain wide area spatial data around the pipeline (PING A) followed by 2 (PING B) High Frequency 630kHz pings for the highest resolution of the pipe producing both a FAT and MAX 4D Image in real-time, followed by a Mid Frequency 375kHz pipeline image again with FAT and MAX 4D images covering potential spans and troughs adjacent to the pipeline.

The MAX images (3 off) are collected as “alternate” data and not viewed in real-time but available offline for analysis and/or processing.

PC Specifications for 4G Underwater Survey Explorer® (4G USE®)

Hardware Requirements revision date	September 9, 2020
Processor	Intel® Core™ i7 Recommended
RAM (Computer Memory)	Minimum 8 GB Recommended
Disk Space (Software)	100MB for installation (approximately 3.0-3.5 GB per hour, dependent on ping rate)
Disk Space (Data Storage)	500 GB Recommended Data storage rate is typically up to 3.5 GB per hour (dependent on ping rate, UIS camera and charts and model data loaded)
Graphics (Laptop/Desktop)	nVidia® Geforce GTX 1060 or higher (Recommended) with 4GB RAM <i>NOTE: AMD Radeon™ GPUs is not supported.</i>
Operating System	Microsoft® Windows® 10.
Ethernet (LIVE Operations)	1 x 10/100/1000 Port Minimum 2 x 10/100/1000 Port Recommended
USB 2.0/3.0 ports	3 minimum 6 recommended <i>USE Dongle requires at least 1 spare USB 2.0 Port for operation in LIVE or REPLAY</i>

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