

The SeaBat T-series Modular, compact multibeam sonar family that grows with your business





A vision of quality and performance

For over 40 years, RESON has been the world's most trusted provider of advanced multibeam sonar technology for high resolution hydrographic surveys. The new SeaBat T-series is the latest addition to our class-leading portfolio of marine survey solutions.

Crafted from decades of sonar expertise and shaped by direct user feedback, the SeaBat T-series helps you drive efficiency on board with fast throughput of exceptionally clean data and precise imagery, augmented by user-friendly data management tools, getting it right the first time.

Seeing is achieving

The SeaBat T-series is built on scalable next generation technology with modularized flexibility to evolve alongside your business. The SeaBat T-series is perfectly suited for small survey platforms through to larger vessels, from water-proof portability to state-of-the-art full sensor integration, covering a wide range

of survey applications and tasks. Built-in, configurable features – such as Normalized Backscatter, Compressed Water Column Data and intelligent automation – deliver highly accurate data that can be easily and quickly analyzed, according to your specific needs.

Ultimate flexibility

The SeaBat T-series introduces new ways to help you expand your business, including faster setup times, better automation and higher quality and more versatile data. And when we say expand your business we mean it literally. The SeaBat T-series is uniquely designed as a highly modularized sonar concept, where you can start out with a smaller SeaBat T20 and later upgrade your sonar simply by replacing the receiver array.

The user friendly configuration utility SeaBat Updater software, enables you to configure a portable or a rackmounted T-series sonar processor between 1° super compact and lightweight SeaBat T-20 to the ultra-high resolution SeaBat T50.

The unique modular design concept of the SeaBat T-series allows the user to connect exactly the wet-end configuration preferred for the job at hand.



No job is too big or too small – the T-Series can handle any Challenge

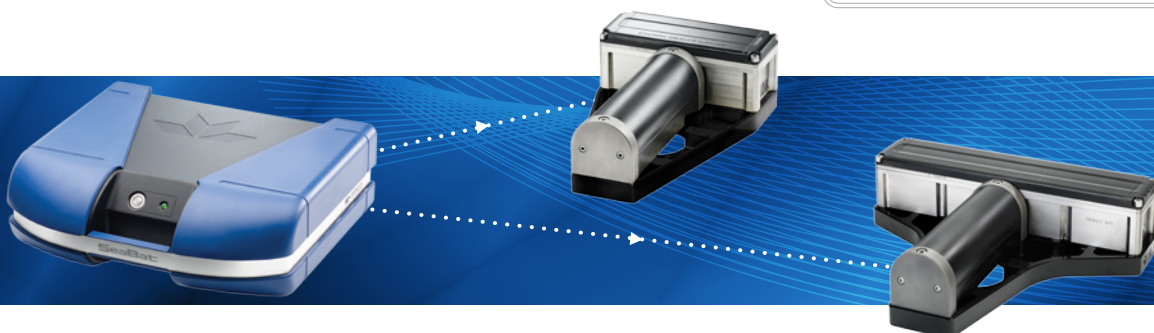
SeaBat T20/T50-P – a highly portable survey solution

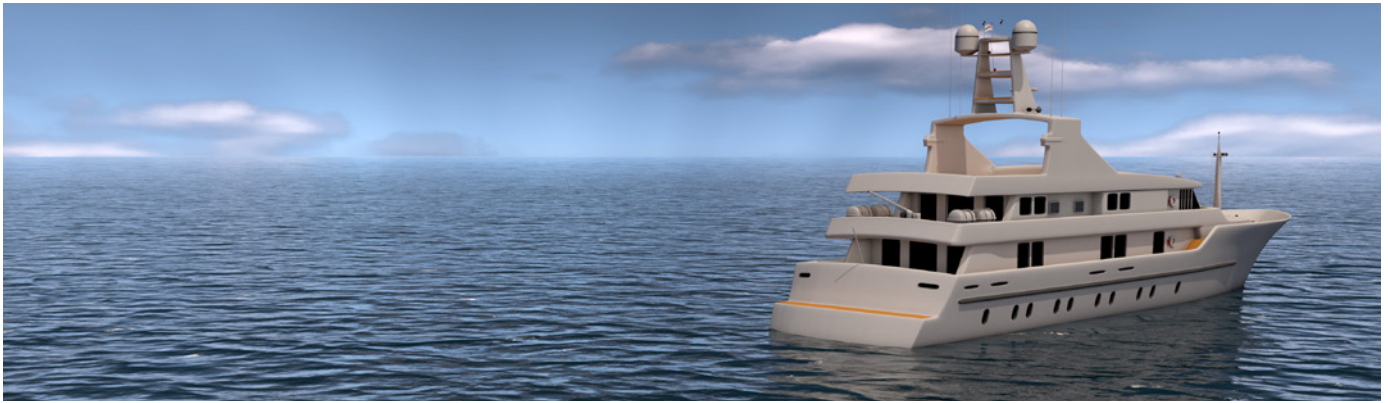
The portable T-series solution offers the ultimate combination of portability and performance. With the SeaBat Portable Sonar Processor, survey data is optimized and mobilization time is reduced to help you focus on getting the job done.

The modularized T-series concept allows you to swap between the small and extremely portable SeaBat T20-P to the ultra-high resolution SeaBat T50-P – simply by swapping between receivers.

- Transducer configuration 0.5° x 1° or 1° x 1° - depending on selected receiver component
- Next-generation electronics
- Compact and low-weight transducers
- Controlled using the SeaBat User Interface from a laptop or survey PC
- Easy connection and single point, accurate time-tagging of serial survey sensors
- Water resistant (IP54)
- Flexible power interface 24V DC or 100-230VAC
- Robust and durable design

The Portable Sonar Processor handles time tagging and processing of sonar and sensor data internally, removing the requirement for accurate time tagging of your laptop ensuring accurate tested and reliable processing of sonar data.





SeaBat T20/50-R – Complete Single Head or Integrated Dual Head survey system

The extremely compact rack-mounted T-series sonar processor forms the basis for both the highly modularized SeaBat T-series single head solutions and the Integrated Dual Head.

Choose the modularized single head SeaBat T20/50-R – where your sonar properties changes completely simply by replacing the receiver.

Choose the magnificent swath coverage and impressive resolution from the fully Integrated Dual Head SeaBat T20/50-R

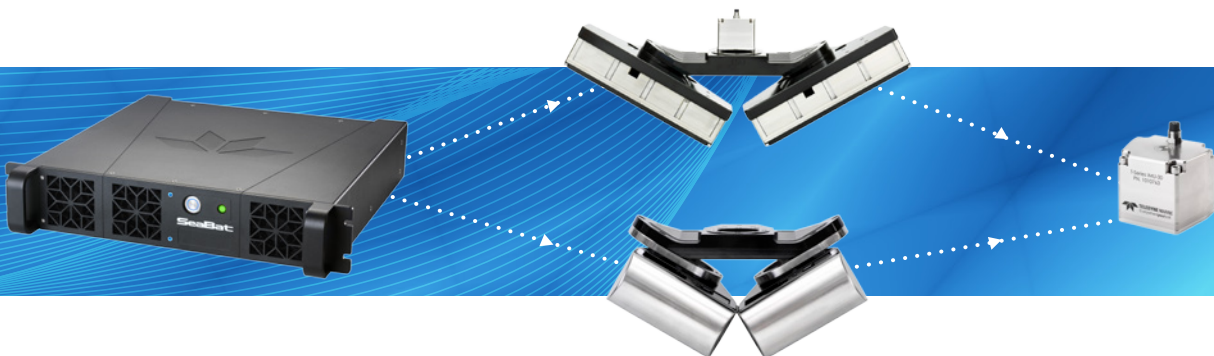
Regardless of sonar choice you will have the option of a built-in industry recognized inertial navigation system.

The T-series rack-mounted sonar processor is designed to be used also with future sonar developments and is the future-proof choice when it comes to flexibility, reliability and sensor integration.

Built-in INS

The INS system built into the T-series rack-mounted sonar processor comes pre-configured and ready to be interfaced to your preferred acquisition software.

SeaBat T20/50-S provides the highest quality survey data in a fully integrated sonar processing and data storage unit housed in a subsea pressure vessel. Interfacing via standard Ethernet to reduce integration time.



In-depth precision and performance

Our world-class sonar technology is the result of many years' combined research and development, innovation and hands-on experience from servicing customers' needs – worldwide.

The SeaBat T-series introduces new ways to help you expand your business, including faster setup times, better automation and higher quality and more versatile data.

Our powerful feature set is able to scale alongside your business providing unmatched utility across a wide range of survey applications.

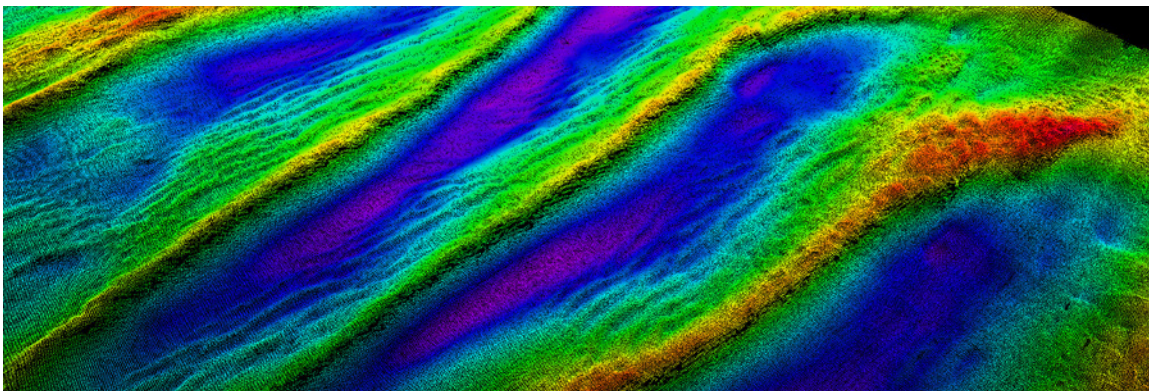
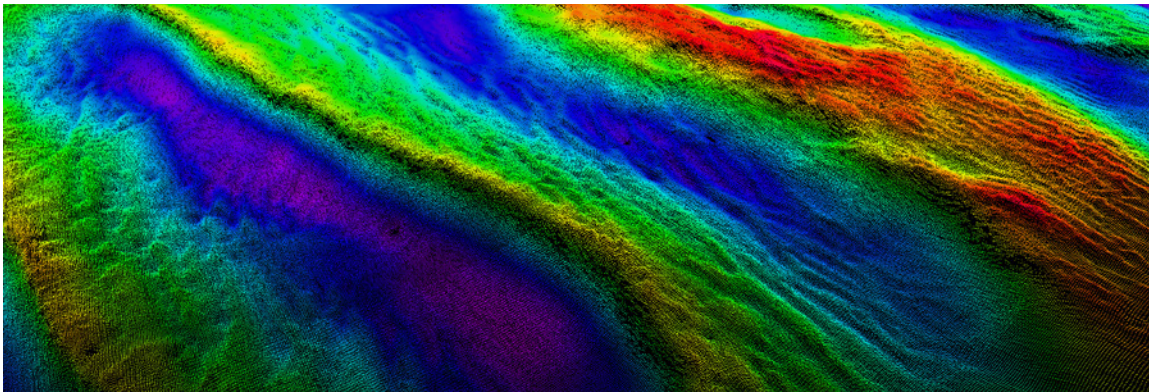
SeaBat for Hydrography

The SeaBat T-series has been designed to provide exceptional acoustic performance for high precision surveys that require minimal data cleaning and post-processing. The SeaBat T-series will get you're the data you require; cleaner, faster, cheaper.

Built to facilitate a wide range of hydrographic tasks, the SeaBat T-series offers a number of data management tools, both the User Interface and the sonar is fully user configurable – or you

can use the intelligent Tracker Autopilot – and maintain focus on other tasks at the same time. The SeaBat T-series helps you to meet survey requirements, develop a greater capacity for taking on new project opportunities and maximize your business potential. Highly customizable and adaptable to a wide variety of applications, it also enables you to reduce survey and post-processing times to lower costs and offer a more competitive service to your customers.

Sandwaves, SeaBat T50 (data courtesy of Hamburg Port Authority)

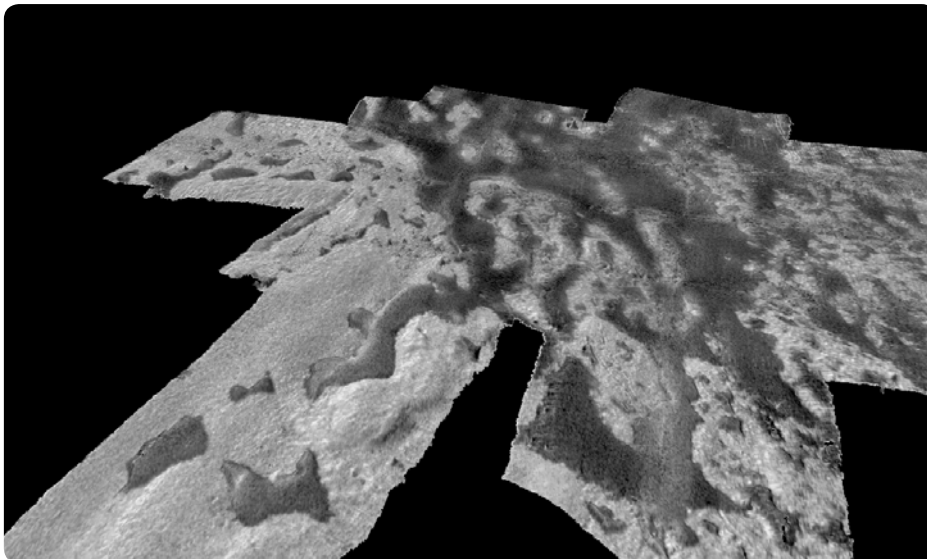
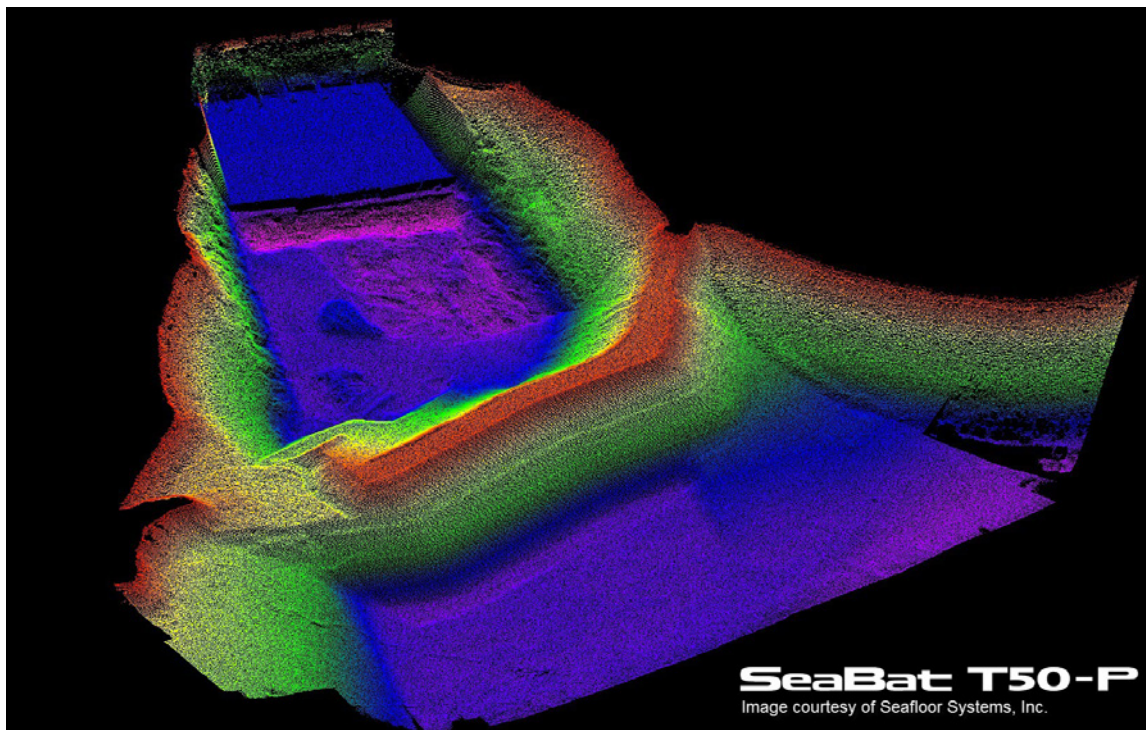


SeaBat for Environmental Research

The SeaBat T-series provides a complete solution for collecting valuable environmental research data, including the new and unique Normalized Backscatter – designed for efficient characterization of the seabed and habitat mapping – and the new Compressed Water Column Data format that significantly reduces the data volume when investigating for features in the water column.

Highly customizable and adaptable to a wide variety of applications, it also enables you to reduce survey times to lower costs and offer a more competitive service offering to your customers.

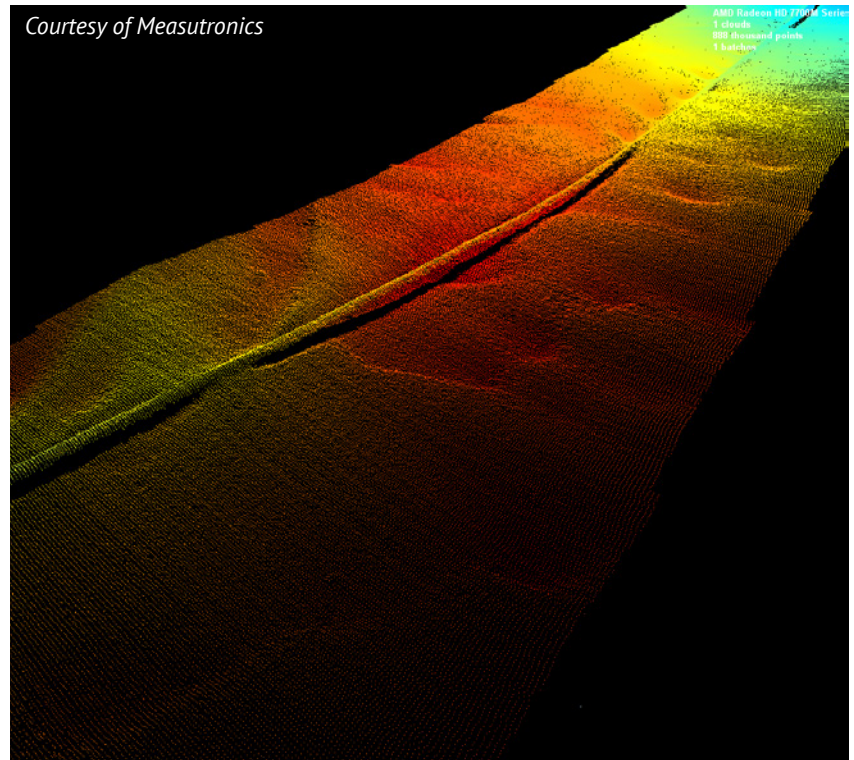
Spillway at Folsom Dam, USA



Normalized Backscatter processed and visualized using QPS FMGT and Fledermaus

SeaBat for Pipeline Surveys

Building on the power of FlexMode, SeaBat now offers real-time pipe detection and tracking to minimize risks when assessing pipeline integrity. The unique feedback loop from pipe position to multibeam signal processing enhances pipeline profiling and detection performance. Coupled with our intelligent automated control systems, SeaBat can minimize processing times and make better use of resources and manpower.

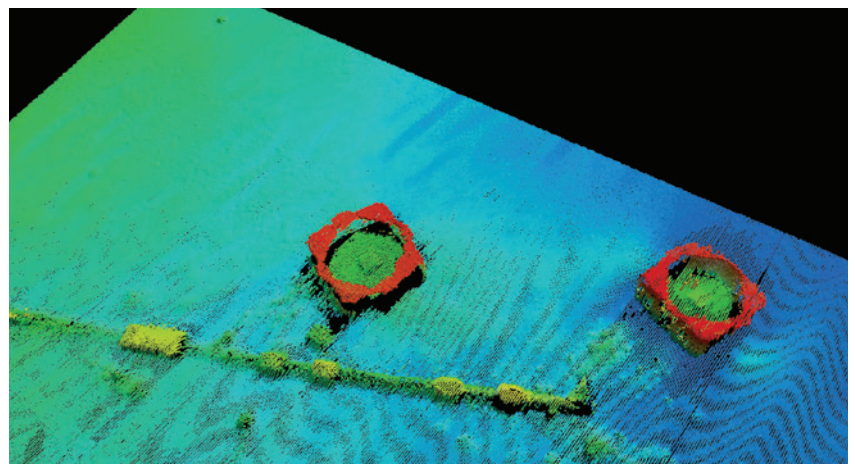


Pipeline survey taken in single pass

SeaBat for Offshore and Renewables

With a comprehensive set of user-friendly data management tools and sophisticated functionality, the SeaBat T-Series is perfectly suited to the offshore and renewable industries. A high density mode provides superior image clarity for complex structures on the seabed, and the new multidetect in-the-water column feature enables catenaries of small-diameter cables to be captured all the way from structure to seabed. In addition, the unique FlexMode function enables high-definition trench surveys for small diameter cables and pipes.

Offshore and renewables



Features designed around you

Over the years, we've developed a uniquely customer-focused approach that delivers an even better, more intuitive user experience and reliable, cleaner survey results every time. To help you get the most out of your investment, we've created a powerful set of features to suit both entry-level surveyors who need uncompromising quality and advanced users who demand world-class performance. We know that you need to stay adaptable to changing survey requirements, which is why our systems can be tailored to suit your individual needs.

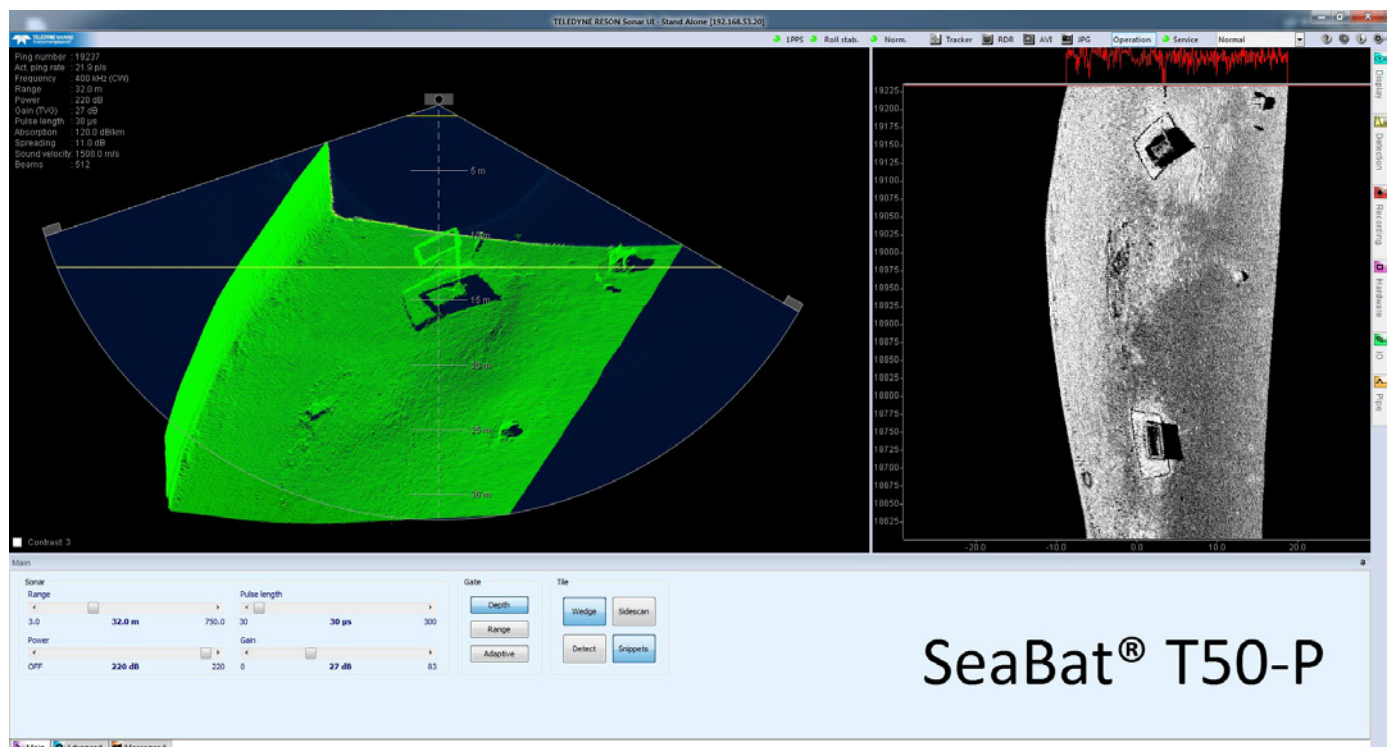
SeaBat Sonar User Interface – powerful and simple

The SeaBat User Interface has been developed to provide complete control over your survey tasks, providing the perfect blend of versatility and productivity.

A new multi-view function provides simultaneous control of bathymetry, water column, snippets and sidescan backscatter. The software also comes with full dual head support, real-time sound velocity filter, water column recording loop and in multiple languages.

We offer a wide range of survey sensors through our trusted 3rd party network, including:

- Motion sensors
- GPS
- Sound velocity
- Survey software



Advanced feature packs

Improved data quality

Tracker – intelligent automation

Our automated Tracker autopilot intelligently optimizes all primary sonar parameters, such as range, power, gain, pulse length and even swath width. Real time analysis of the quality of the acoustic signal provides a hands-off sonar in most conditions. Cleaner data is generated via a user-friendly system that can be tailored for advanced users and has pre-set parameters to help less experienced users get started. We are constantly evolving the Tracker with new features; for example, our new Constant Swath mode simplifies survey planning by allowing you to set a desired swath width that is maintained at varying depths so the survey job can be carried out at constant line spacing for increased efficiency.

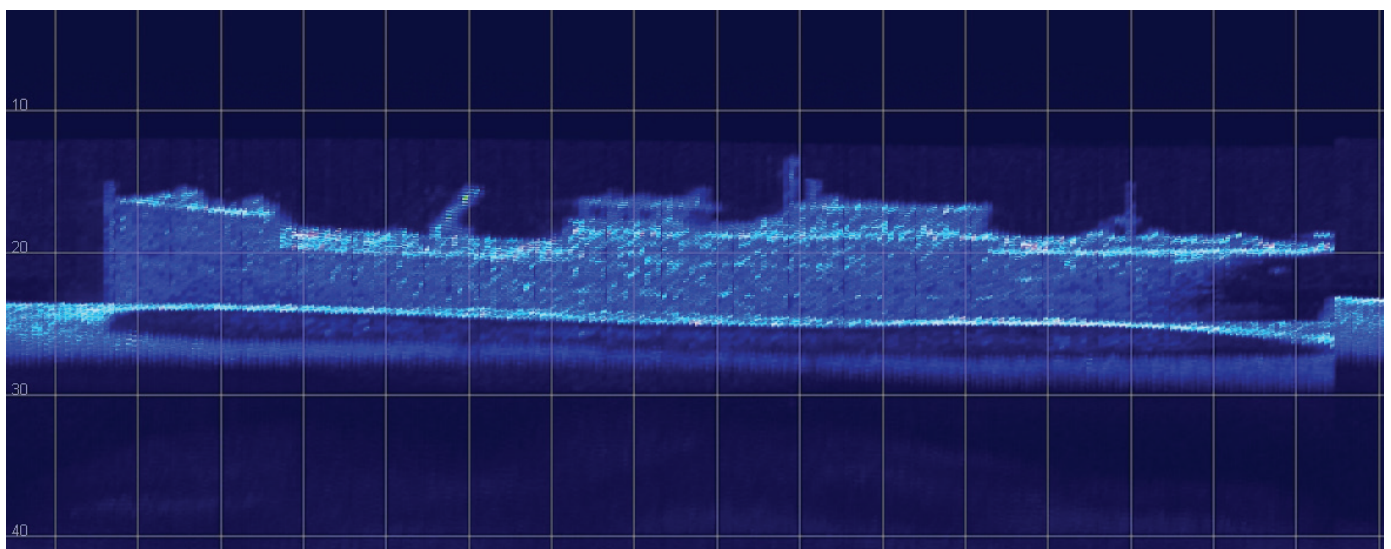
Compressed Water Column – reduce data volume

Incorporating intelligent and user configurable data reduction algorithms the SeaBat T-series can record water column backscatter data at significantly reduced data volumes, potentially allowing for continuous recording of compressed water column data.

Water column visualization – see more of what's below

Our 2D water column display allows visualization both along track and across. This unique display can be combined with logging of our new compressed water column data format – a user-configurable format that allows for significantly reduced data volumes of water column information. Compressed water column data is supported by, and can be processed using, QPS FMMidwater.

Water column detection



Shorter processing time

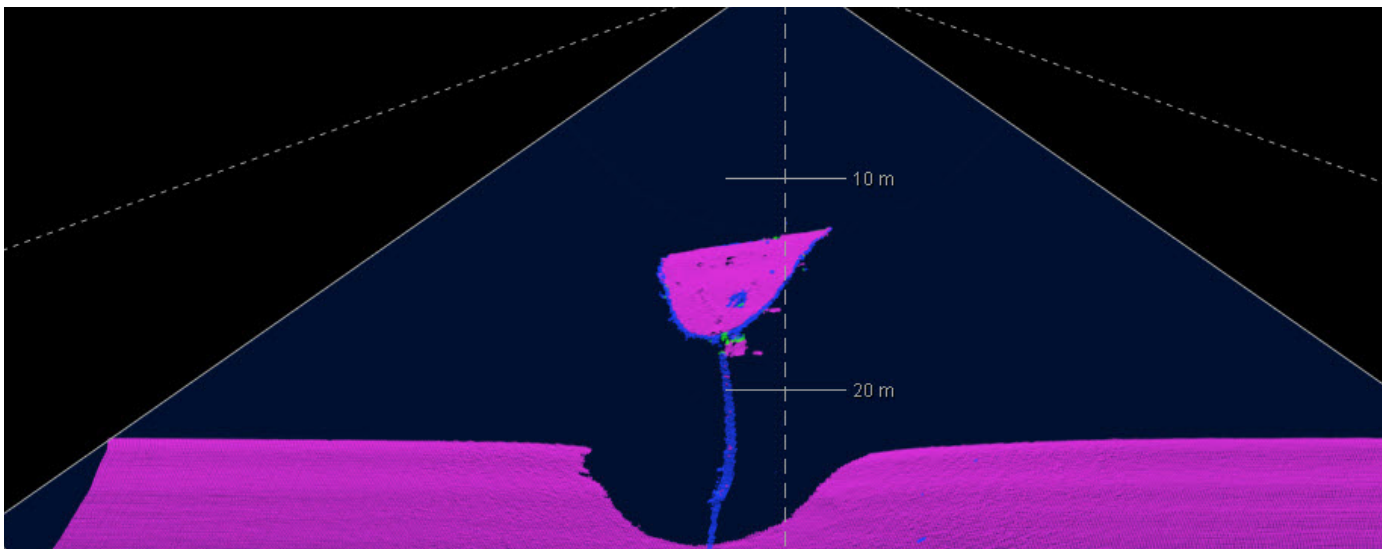
X-Range and Full Rate Dual Head – wider coverage and cleaner data

When you need more from your multibeam system, X-Range can extend survey coverage by up to 30% and will improve your depth performance as well. X-Range reduces noise impact from external sound sources and from general noise in the water column. X-Range makes it possible to operate dual head systems at full ping rate without sacrificing resolution.

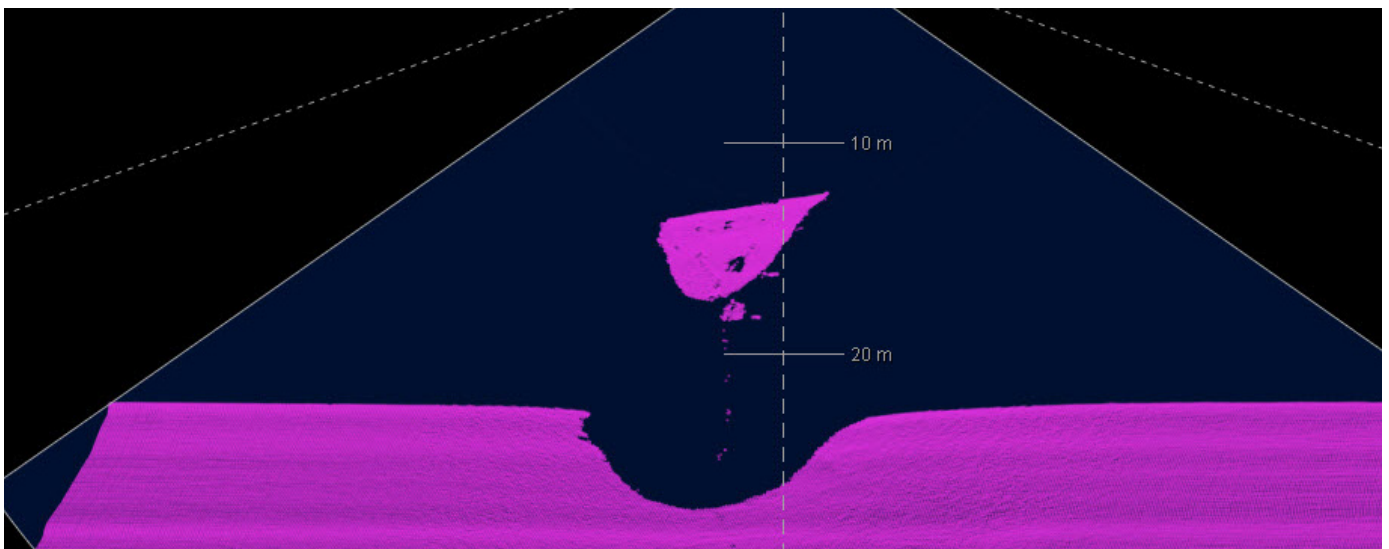
Multidetetect – capture the fine details

The new multidetect feature provides multiple detections within each beam to capture highly detailed images of complex objects and challenging seabed terrain. Easier and faster than water column processing, multidetect reduces the need for collecting large water column data sets and reduces the processing time by detecting on the fine details in real time.

Multidetect



Singledetect



Advanced feature packs

Shorter survey time

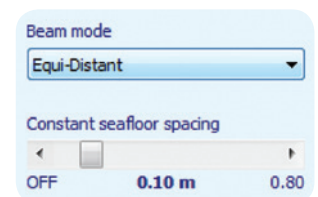
Normalized Backscatter – accurate and reliable

The normalized backscatter process is applied to the snippet record to generate a magnitude signal that is compensated for the characteristics of the sonar providing the operator with information that depends only on the environment (water column and seafloor). The development of normalized backscatter is the result of extremely tight tolerances in the manufacturing process, extensive test & verification and a continued investment in research & development. The T-series provides repeatable and reliable backscattering strength even with fully automated sonar operation.

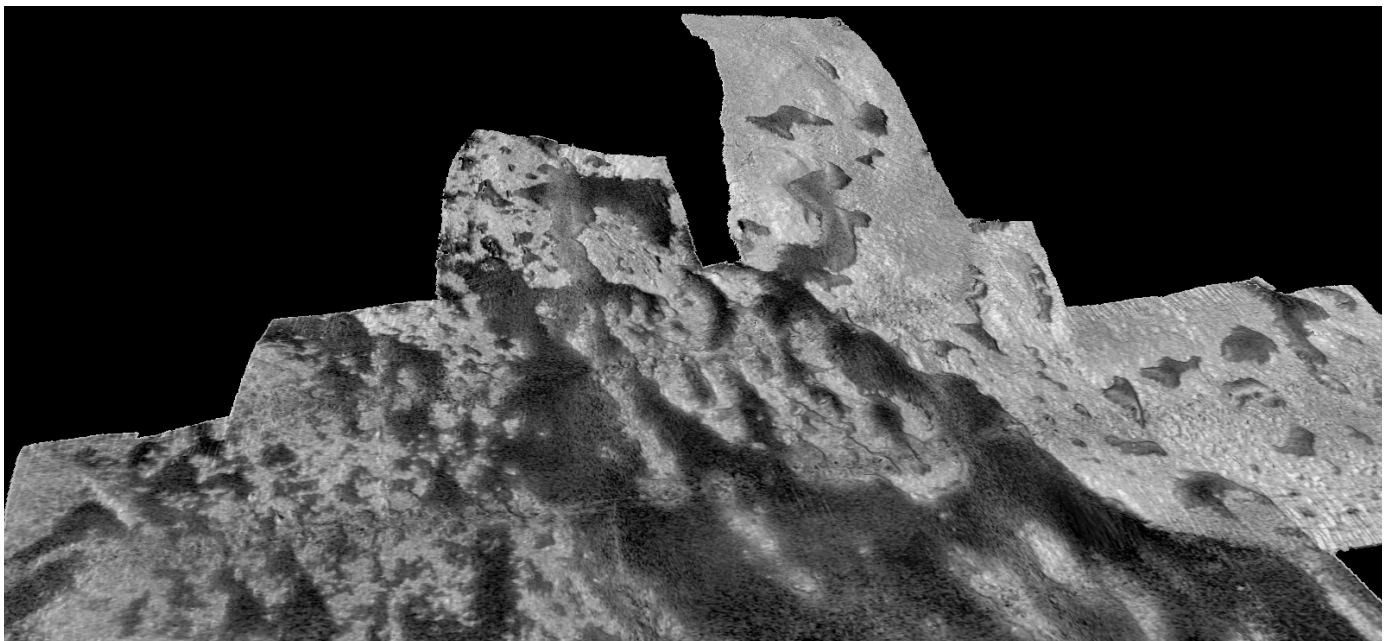
Configurable beamformer – customize your solution

The configurable beamformer allows everything from high density beams for exceptional image clarity and detail, to just a few beams to deliver results faster.

By deploying fewer beams in shallow water, the system allows the user to reduce storage requirements by gathering only the data you need. The system can also hold constant seafloor spacing between beams to provide the same high-quality results with minimal data volume. The fully user-configurable beamformer is also what allows us to beamform in FlexMode – ie. a combination of a high-density equi-angular beam distribution and a lower density equi-distant beam distribution.

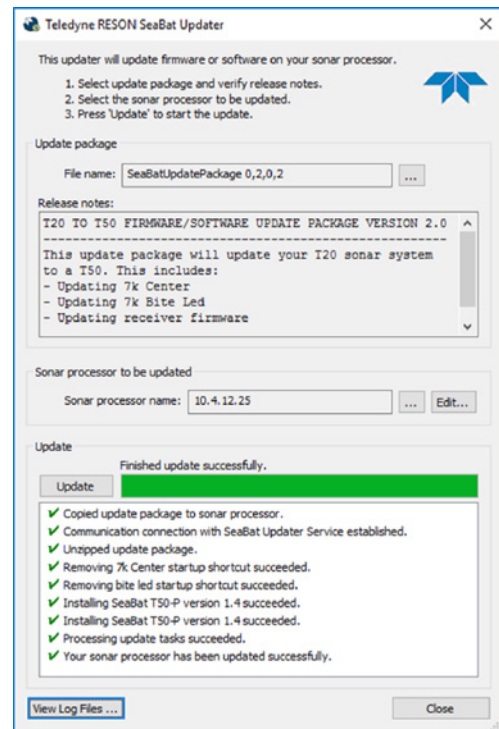


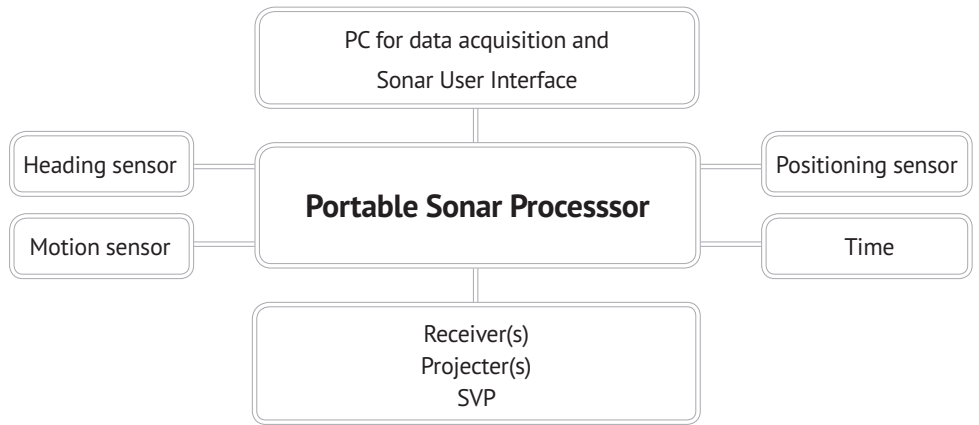
Normalized Backscatter processed and visualized using QPS FMGT and Fledermaus



Ultimate flexibility with SeaBat Updater

SeaBat Updater is an easy-to-use configuration utility that allows you to configure your SeaBat sonar processor for the 1° super compact and lightweight SeaBat T20 – ideal for the small boat installation or the job that requires very rapid deployment. The next day SeaBat Updater easily configures your sonar processor to interface with the ultrahigh resolution SeaBat T50 transducers. True flexibility – select the sonar head required for the job at hand.





Easy sensor cabling using the Portable Sonar Processor

The Portable Sonar Processor is an essential organizational component that keeps your data synced and time-stamped at a single source. Fewer connections help to keep things simple for operators who need to mobilize quickly and maintain efficient, productive operations at all times. It is also water resistant rated (IP54) allowing you a wider range of locations for installation.



Portable Sonar
Processor sensor interface

Optional Features:

Dual head bracket



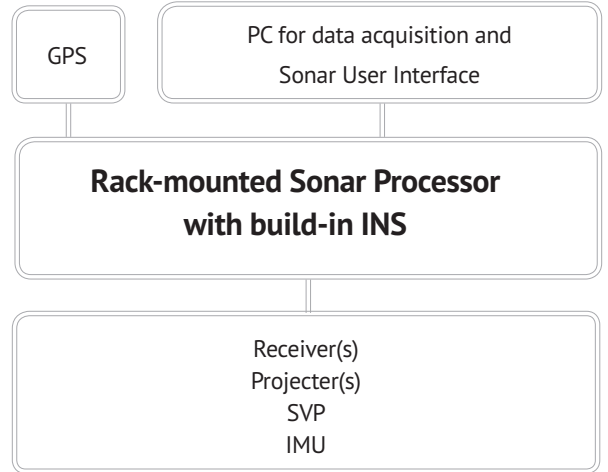
Hydrodynamic fairings





Dual sonar head, single topside – with integrated INS

The rack-mounted sonar processor (RSP) with optional integrated INS serves as a complete survey system. Wet-end components, GPS-antennas and sound velocity sensor, everything interfaces easily to the pre-configured RSP. Connect your acquisition computer to the standard local area network connection and you are all set.



Inertial Measurement Units (IMU)

Durable yet light weight titanium housing IMU mounts directly on your SeaBat T-series sonar head for optimum performance and ease of configuration.



Integrated dual head Rackmounted Sonar Processor with built-in INS

Narrow installation adaptors for dual head SeaBat T20



IMU



Features at a glance

Maximum productivity during data collection

- Up to 220 degree swath coverage with T-series integrated dual head
- Roll Stabilization
- Up to 1024 beams – fully user configurable

Uncompromised clean data sets

- Quality filters/flags
- Intuitive yet very comprehensive Sonar User Interface
- Industry-leading bottom detect methods

Ease of installation and use

- Fully automated operation with adaptive Tracker autopilot
- Extremely lightweight mounting brackets to ease installation

Maximum operational flexibility

- 190 - 420kHz fully frequency agile operation
- Simultaneous output of multiple data formats (bathymetry, normalized backscatter etc.)
- Adaptive gates to prevent interference from external noise
- Uncertainty output



For more details visit: www.teledyne-reson.com or contact our local Teledyne RESON office.



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