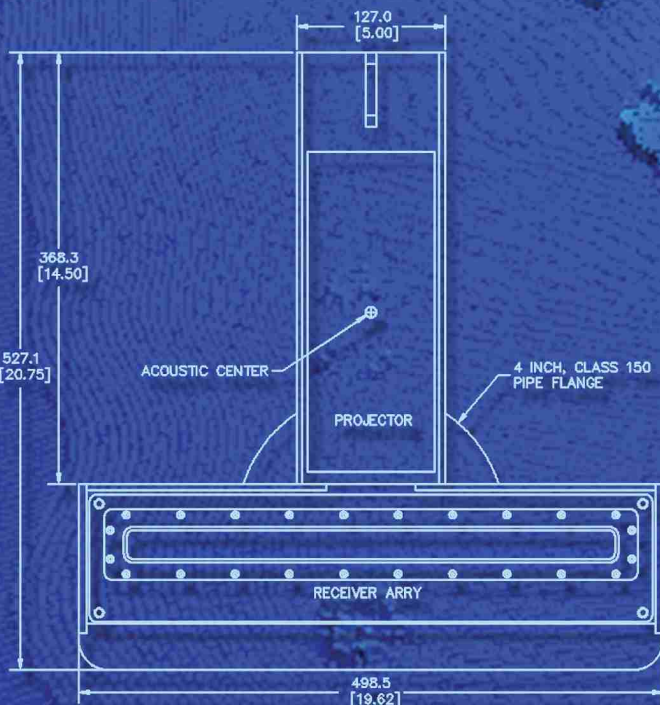




Pioneers of Wideband
High Resolution
Multibeam Systems



www.R2Sonic.com



Company Profile



R2Sonic was founded in February 2006 by three veteran underwater acoustical engineers; Jens R. Steenstrup, Mark Chun and Kirk Hobart; with the mission to utilize their experience to bring high quality, leading edge underwater acoustic products to the private and public sectors, with focus on customer needs.

R2Sonic founders and personnel bring over 25 years of market driven quality engineering design and manufacturing experience, utilizing “best practice” design and manufacturing process.

R2Sonic brings pioneering values to the industry. With the launch of the innovative Sonic 2024 and 2022 Broadband / Wideband Multibeam Systems, R2Sonic has redefined the Multibeam market with unparalleled performance with unique system features and application growth capabilities.

Facilities

The facilities are located on the west side of Santa Barbara's high technology area with University of California at Santa Barbara, Santa Barbara Airport and the ocean within walking distance. The laboratories are well equipped with modern instrumentation and software tools necessary for the efficient modeling, development and test of underwater acoustical equipment.

Systems Overview

The Sonic Broadband / Wideband Multibeam Echo Sounders represent the latest in advanced underwater acoustic technology.

The Sonic 2024 and 2022 are the world's first true wideband high resolution shallow water multibeam echo sounders. With proven results and unmatched performance, the Sonic systems produce reliable and remarkably clean data with maximum user flexibility through all range settings to 500m.

The unprecedented 60 kHz signal bandwidth offers twice the resolution of any other commercial sonar in both data accuracy and imagery.

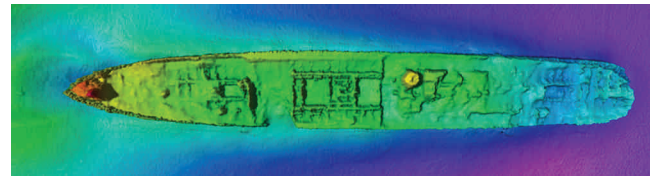
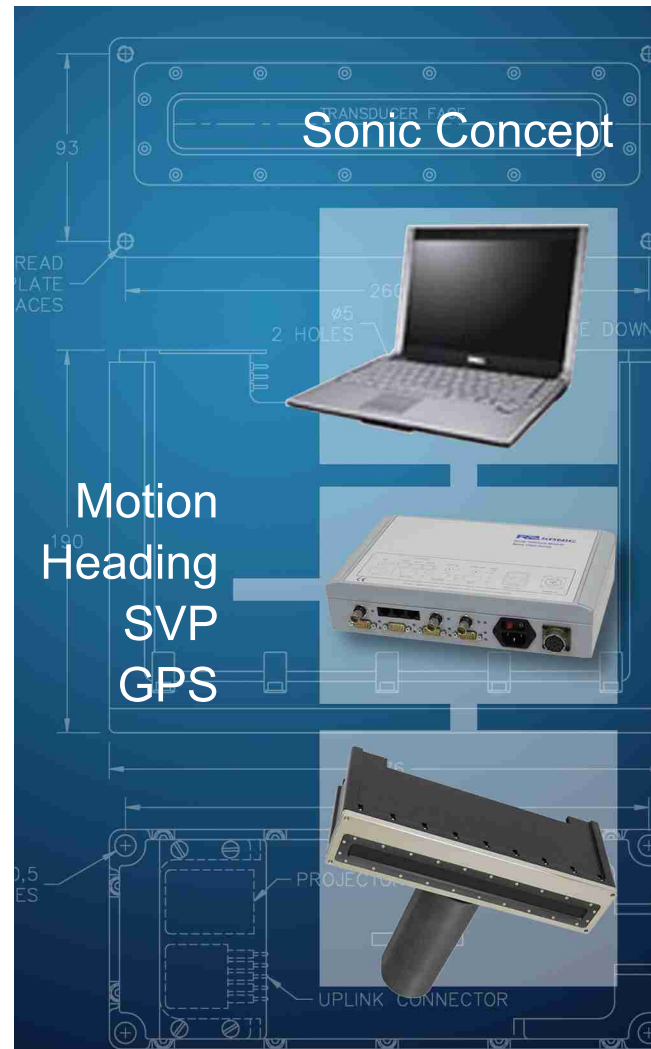
With over 20x selectable operating frequencies to choose from within the 200 to 400kHz band, the user is not limited by two or three operating frequencies and thus can trade off resolution and range and effectively control interference from other active acoustic systems.

In addition to selectable operating frequencies, Sonic systems provide variable swath coverage selections from 10° to 160° on the fly, in real-time and across all frequencies from 200 to 400 kHz. The operator may also rotate the sector to precise location either port or starboard side of the vessel. No other high resolution, high frequency sonar offers such variability of coverage and productivity.

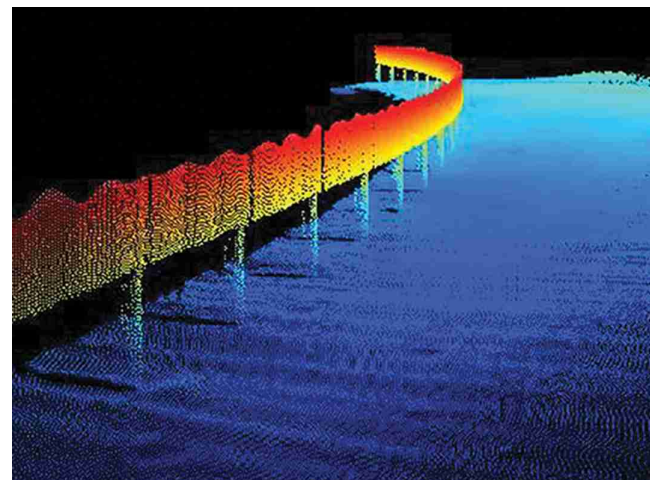
When a narrow sector is selected, all soundings are concentrated within the swath for increased resolution over small scale bottom features. Wide swath sectors are typically used for general mapping or when surveying vertical surfaces such as quays, breakwaters, dams, pilings or bridge abutments as the increased opening angles eliminate need to rotate the sonar head.

Sonic system performance is characterized by low internal noise, high signal dynamic range and true broad band signal processing that suppress multi-bounce interference at greater beam angles.

Advanced functions including equidistant beam spacing and roll Stabilization are also incorporated for both the Sonic 2024 and 2022 systems, increasing system overall efficiency.



30° - 45° coverage, for increased resolution over bottom features



160° coverage, for mapping high up vertical surfaces

Components

Sonic Wideband Multibeam systems represent new modern design and architecture, unencumbered by legacy designs.

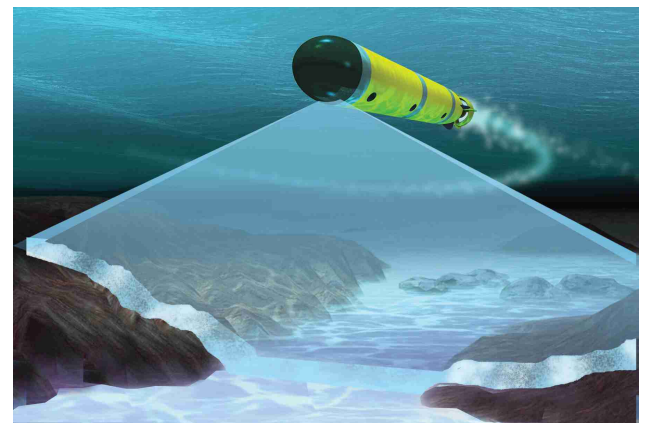
The heavy, bulky and power consuming topside electronic components that characterize old multibeam echo sounder technology have been eliminated.

The sonar consists of three major components: a compact and lightweight projector, a receiver and a small dry side Sonar Interface Module (SIM). The extremely low power draw of 50W (for Sonic 2024) and 35W (for Sonic 2022) makes it possible to operate the systems on vessel battery power.

Unlike other commercial shallow water multibeam echo sounder systems, all processing is embedded in the sonar receiver, dramatically increasing system efficiency and simplicity in integration.

Third party auxiliary sensors are connected to the sonar Interface module. The sonar data is tagged with GPS time. The compact size, low weight, low power consumption and elimination of separate topside processors make Sonic Wideband Multibeam systems very well suited for small survey vessel or ROV/AUV operations.

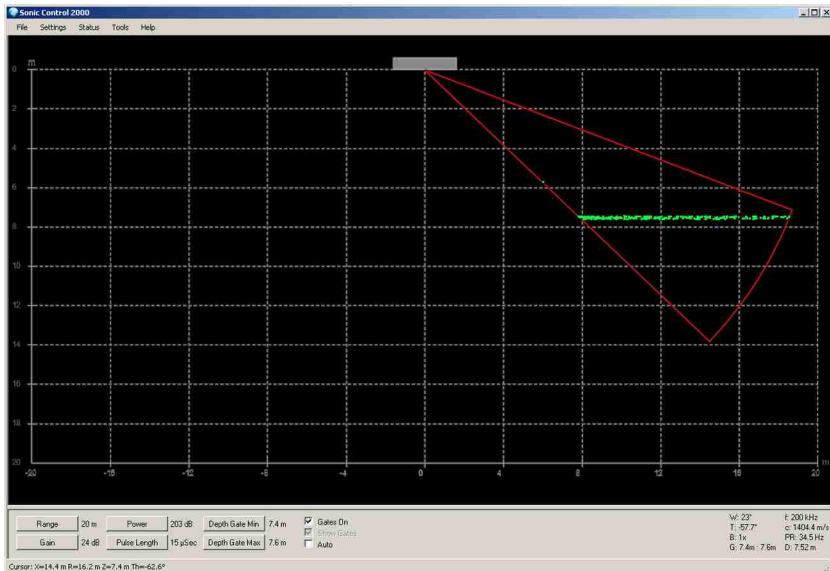
For AUV integration, apart from the transmit and receive transducer, the only hardware to be housed on the AUV is an interface board the size of a PC/104, Ethernet ports, and the provision of isolated 48V DC power.



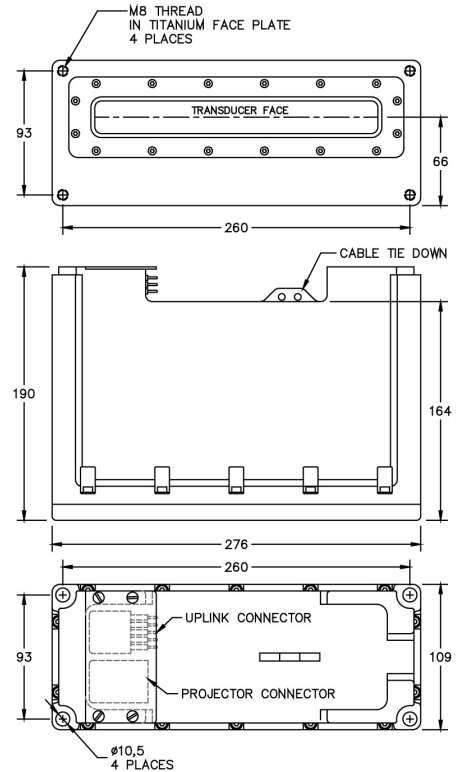
AUV Survey Operation with
Sonic Wideband Multibeam system

Operation

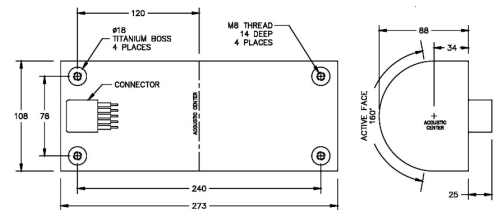
The sonar operation is controlled from a graphical user interface (GUI) on a PC or laptop, which is typically equipped with navigation, data collection and storage application software. The operator sets the sonar parameters in the sonar control window, while depth, imagery and other sensor data are captured and displayed by the application software. Commands are transmitted through an Ethernet interface to the Sonar Interface Module (SIM). The SIM supplies power to the sonar heads, synchronizes, time tags sensor data, and relays data to the application workstation and commands to the sonar head. The receiver head decodes the sonar commands, triggers the transmit pulse, receives, amplifies, beamforms, bottom detects, packages and transmits the data through the SIM via Ethernet to the control PC.



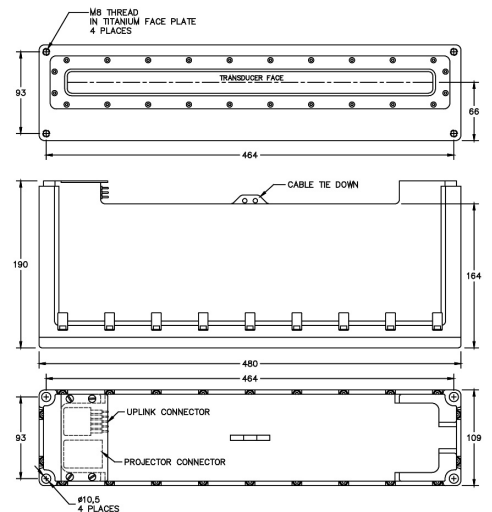
Graphical User Interface (GUI)



Sonic 2022 Receiver



Sonic 2022/2024 Projector



Sonic 2024 Receiver

Technical Specifications

Feature	Sonic 2024	Sonic 2022
Frequency	200 to 400kHz Over 20 frequency selections User selectable in real-time	√
Bandwidth	60 kHz, all frequency selections	√
Beamwidth	0.5°x1° at 400kHz 1°x 2° at 200kHz	1°x1° at 400kHz 2°x2° at 200kHz
Swath Sector	10° to 160° All frequency selections User selectable in real-time	√
System Range	to 500m	√
Ping Rate	up to 60 Hz	√
Range Resolution	1.25cm, all frequency selections	√
Pulse Length	15µs-500µs	√
Number of Beams	256	√
Near-field Focusing	Yes, all beams, over entire swath	√
Equiangular or Equidistant beams	Yes	√
Roll Stabilization	Yes	√
Rotate Sector	Yes	√
Depth Rating	100m, 3000m optional	√
Operating Temp.	0°C to 50°C	√
Storage Temp.	-30°C to 55°C	√
Mains	90-260 VAC, 45-65Hz	√
Power Consumption	50W	35W
Uplink/Downlink	10/100/1000Base-T Ethernet	√
Deck Cable Length	15m, optional 25m, 50m	√
Receiver Dim (LWD)	480 x 109 x 190mm	276 x 109 x 190mm
Receiver Mass	12 kg	7 kg
Projector Dim (LWD)	273 x 108 x 86mm	√
Projector Mass	3.3	√
SIM (LWD)	280 x 170 x 60mm	√
SIM Mass	2.4 kg	√

Sonar Options

- Snippets Imagery Output
- Switchable Forward Looking Sonar Output
- Mounting Frame & Hardware
- Over-the-Side Pole Mount Hardware
- Sound Velocity Probe & Profiler
- Extended Sonar Deck Cable
- 3000m Immersion Depth

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