Mini-Ranger 2 is part of our family of sixth-generation (6G) Ultra-Short BaseLine (USBL) underwater target tracking systems. It offers a standard operating range of 995 metres (extendable up to 4,000 metres) and the ability to simultaneously track up to 10 subsea targets (e.g. divers, ROVs and structures) at very fast update rates. These features mean that Mini-Ranger 2 is ideal for nearshore operations on small, quiet vessels, vessels of opportunity, pipelay vessels and construction barges that need survey grade positioning performance without the cost and complexity of a deep water USBL solution.

SYSTEM OVERVIEW
Mini-Ranger 2 calculates the position of your underwater targets by measuring the range (distance) and bearing (heading) from a vessel-mounted transceiver to an acoustic transponder fitted to each target; a technique known as Ultra-Short BaseLine (USBL) positioning. One of the main advantages of USBL is that no other in-water acoustic equipment has to be deployed before underwater operations can start. Only the targets being tracked need to be equipped with a transponder.

The Wideband 2 digital signal technology and Sonardyne 6G hardware inside Mini-Ranger 2 provides precise acoustic ranging that is easy to set up and operate, even in the most challenging subsea operating environments. These features improve the efficiency of subsea survey operations, reduce vessel delays and generate cost savings for owners.

Mini-Ranger 2 is compact and highly portable, comprising a rack, desk or console mountable Ethernet Serial Hub (ESH), HPT 3000 acoustic transceiver and software, which is installed on your PC or ruggedised laptop. A wide range of Sonardyne 6G mini transponders can be used with Mini-Ranger 2, allowing you to select the most appropriate beacon for each task. These include: Wideband SubMini 6+ (WSM 6+), Release Transponder 6 family (RT 6), Wideband Mini Transponder 6 (WMT 6) and the ultra-small Nano.
HPT 3000
At the heart of Mini-Ranger 2 is the HPT (High Performance Transceiver) 3000 transceiver. Small and lightweight, HPT 3000 is perfect for installation using temporary, over-the-side deployment arrangements.

The transceiver features a unique design of receiver array and transmitter, optimised to provide excellent tracking performance in shallow water, at high elevations, as well as in deeper water. USBL precision is dependent on the baseline between the receiver elements and signal to noise. This is where the HPT 3000 excels; its larger diameter array provides excellent precision and noise rejection.

A key feature of the HPT 3000 is Ethernet-based communications. This means connection to the topside computer (via the Ethernet Serial Hub, or ESH) is simple as it can be connected through a vessel’s network via a single network socket – eliminating USB-to-serial drivers and their associated compatibility problems. Ethernet communications also enables in-water diagnostics, allowing you to both listen to, and visualise, signals and noise in the water.

ETHERNET SERIAL HUB
The ESH provides the interface between peripheral sensors, acoustic instruments, mains power and the software running on the PC. The ESH also supports responder trigger and one pulse per second synchronisation across systems.

SOFTWARE
Mini-Ranger 2 uses the same modern and intuitive software as our deep water USBL system, Ranger 2. An extensive set of tools are included to allow you to optimise system performance, including real-time audio and visual signal and noise analysis displays. Our CASIUS calibration tool is also included to correctly calibrate gyro and VRU offsets further improving positioning accuracy. A built-in calibration routine of the internal magnetic sensor minimises the time between installation and tracking.

If you need to track and also communicate with AUVs and drones, an optional Marine Robotics pack is available. Used in conjunction with our Nano AvTrak 6 transceiver on your vehicle, the pack unlocks a host of features such as Data Exchange – used to enable modem functionality utilising Wideband 2 digital signal processing, which supports user data transfer rates from 200 to 9,000 bps.