Scout USBL is a complete vessel-based acoustic positioning system designed for tracking divers, ROVs, and towfish in waters up to 1,000 metres. The system calculates the position of a subsea target by measuring the range (distance) and bearing (heading) from a vessel-mounted transceiver to a small acoustic transponder fitted to the target; a technique known as Ultra-Short Base Line (USBL) positioning. USBL is widely used by the offshore survey and ocean scientific industries as it offers high accuracy performance combined with efficient subsea tracking operations.

Fast and Efficient Operations
One of the main advantages of the USBL technique is that no other in-water acoustic equipment has to be deployed before underwater operations can commence. Only the targets being tracked need to be equipped with a transponder.

With Scout, a boat can arrive on location and begin tracking straight away. This has particular benefits for search and salvage applications when search times are critical.

Scout Product Family
Three versions of Scout USBL are available: Scout, Scout Plus, and Scout Pro.

Scout and Scout Plus are entry level systems designed for general target tracking applications at ranges up to 500 metres. Scout can track one surface vessel and four subsea targets, whilst Scout Plus can track six targets and incorporates a Responder mode. This enables the system to calculate a target’s position at a much higher update rate, ideal for fast moving vehicles such as ROVs and towfish.

With both versions, all sensors and hardware are provided whilst the software is simple to learn and intuitive to use. These features make Scout and Scout Plus the ideal solution for users with little or no prior experience of acoustic systems.

Scout USBL at a glance
- Affordable and high accuracy tracking system for divers, ROV, and towfish
- Easy to install and use; no prior USBL experience required
- Supports simple through to complex subsea positioning operations
- Up to 1,000 metres slant range
- All sensors, software, and hardware provided
- Portable; can be operated from almost any size boat including RIBs
- Equipment upgrade path to Sonardyne’s deep water USBL system – Ranger
Scout Pro is designed to support complex construction survey applications through its fully featured software. It provides greater accuracy, tracking for up to 10 subsea targets and a 1,000 metre design slant range.

The advanced topside control hardware supplied with Scout Pro systems enables experienced users to operate using Sonardyne’s Wideband digital acoustic signal technology. The benefits of using Wideband include greater immunity to noise interference and a ten fold improvement in measurement repeatability.

System Overview
A Scout USBL system comprises four main components: control software, vessel based interface unit, acoustic transceiver and transponders.

Software
Scout and Scout Plus software is easy to use and intuitive to operate. It is designed to appeal to users who wish to arrive on location and begin tracking a target immediately. Features include clear and simple configuration tables as well as diagnostic tools to assist an operator in preparing the system for tracking an underwater target.

Scout Pro software shares a common look and feel with Sonardyne’s survey grade platform, Fusion. It offers a complete range of tools that include: chart backdrops, industry standard output telegrams and configurable sensor displays.

Interface Unit
As standard Scout and Scout Plus systems are supplied with a rack-mountable Surface Interface Unit (SIU). This supplies power and communications to the transceiver and is connected to the user’s own computer via a serial or USB link.

For complete system portability and operation from almost any size of boat, Scout and Scout Plus systems can be commanded using the Surface Command Unit (SCU).

The SCU incorporates all the features of a rack mounted Surface Interface Unit (SIU), supplying power and communications to the acoustic transceiver. Being completely portable enables operation of Scout USBL systems independently from almost any type of boat, including small RIBs, and in any climate: rain, tropical heat and snow.

The latest version, SCU 2, has been upgraded with a faster processor, more memory, solid state hard drive, a heat exchanger, rechargeable Li-ion battery packs, robust mechanics, a 12” LED backlit screen providing a bright and crisp display that is viewable in direct sunlight and all incorporated in a ruggedized splash-proof case.

The SCU 2 can also be used with Sonardyne’s 6G® autonomous monitoring product range (Fetch, PIES and AMT) for fast and efficient retrieval of logged subsea data.

Scout Pro systems are supplied with a rackmounted Navigation Controller Unit (NCU). In addition to accurately time stamping incoming data from external devices such as GPS, gyros and VRUs, the NCU also provides power and communications for the Scout USBL transceiver.

A range of hardware interface cards are available for interfacing external sensors and transceivers other than the standard Scout transceiver. By simply plugging these cards into the rear of the unit, the role of the Navigation Controller Unit can be transformed from supporting simple to complex acoustic operations.

Acoustic Transceiver
The USBL acoustic transceiver designed for use with Scout systems provides a hemispherical pattern of acoustic coverage underneath a surface vessel. It is suitable for a wide variety of underwater positioning tasks as it enables targets to be tracked from far below through to near surface.
The compact design of the transceiver makes it easy to install on a simple over-the-side mount or through a gate valve. Sonardyne can supply an easy-to-assemble pole, complete with fittings and advice on installation, if required. This ensures the performance of Scout can be optimised for the vessel it is operating from.

To simplify setup, Scout transceivers are equipped with an integrated motion sensor that automatically compensates for the motion of the vessel. For higher accuracy applications, external reference sensors can be used with Scout Plus and Scout Pro.

When tracking targets far behind a vessel, such as a towed side scan sonar, a tilted transducer array ensures that the target is kept within the transceiver’s optimum cone of operation.

**Transponders**

Scout USBLs is compatible with Sonardyne’s family of low cost HF frequency transponders; Coastal, IAT and IRT. These have been designed for applications where size and weight are important operational factors, such as installation on the back of a divers or ROV. The transponders are depth rated to 500 metres and use an alkaline battery pack that provides up to 18 months of listening life.

Scout Plus and Scout Pro both offer additional compatibility with the advanced Wideband Sub-Mini (W SM) transponder. WSMs are available with powerful omni or directional transducers, responder mode for fast position updates, depth sensor to aid USBL positioning accuracy and a rechargeable NiMH battery.

**ViewPoint Navigation Package**

ViewPoint navigation software allows multiple users to explore, visualise and share positioning data from Sonardyne’s USBL product family, including Scout (Scout Plus and Pro only) and Ranger. It transforms co-ordinates of surface vessels, subsea vehicles and structures into geographical information that is overlaid on easy-to-use guidance displays. When changes to Scout are made, such as adding a new tracked target, they automatically appear in ViewPoint, ensuring everyone onboard has access to accurate, real-time positioning information.
Scout Performance Summary

Operating Range
- 500 metres (Scout, Scout Plus)
- 1,000 metres (Scout Pro)

System Accuracy
- 2.75% of Slant Range (Using Scout transceiver’s internal heading and attitude sensor)
- 0.5% of Slant Range (Scout Plus or Scout Pro using external VRU and gyro)

Number of Targets Tracked
- 1 surface, 4 subsea (Scout)
- 1 surface, 6 subsea (Scout Plus)
- 1 surface, 10 subsea (Scout Pro)

Output Telegrams
- Supports all industry standard survey and DP telegrams

Scout USBL Equipment List

Key: ● = Required ○ = Optional

(Please refer to separate technical datasheets)

- Software
  - Scout (Std, Plus or Pro)

- Type 8038
  - Surface Interface Unit

- Type 8039
  - Surface Command Unit

- Type 8028
  - Navigation Command Unit

- Type 8024
  - Scout USBL Transceiver

- Type 7815
  - Coastal Transponder

- Type 7956
  - IRT Transponder

- Type 8044
  - LAT Transponder

- Type 8070/71
  - Wideband Sub Mini Transponder

Scout Key Technology

Multiple Target Tracking
Scout USBL can track up to 10 mobile targets simultaneously up to ranges of 1,000 metres. With the ‘ping stacking’ software feature enabled in Scout Pro, one second position updates can be achieved.

Quick and Easy to Deploy
As soon as a boat arrives on location and deploys its USBL transceiver, tracking of divers and underwater targets can begin. This makes operations using Scout fast and efficient.

Portable
Scout can be operated from almost any size boat including small RIBs. The transponders designed for use with the system are small and robust, ideal when space on an ROV or towfish is restricted.

Heading Sensor
Scout’s transceiver is fitted with an internal motion sensor that automatically compensates for the dynamic motion of the boat. For the highest accuracy, Scout Plus and Pro can be interfaced to external reference sensors such as Sonardyne’s Lodesstar AHRS can be used.

Support
Need to get in touch? Sonardyne’s customer support team are available around the clock to get you the answers you need. From advice on which product to use to operational support, it’s all part of the service.

Other Acoustic Positioning Systems from Sonardyne

- Ranger 2 USBL
- Fusion 6G+ IBL
- Marksman USBL
- Prospector IBL