



Systeme de positionnement acoustique

OBC

Transpondeur côtier



Introduction

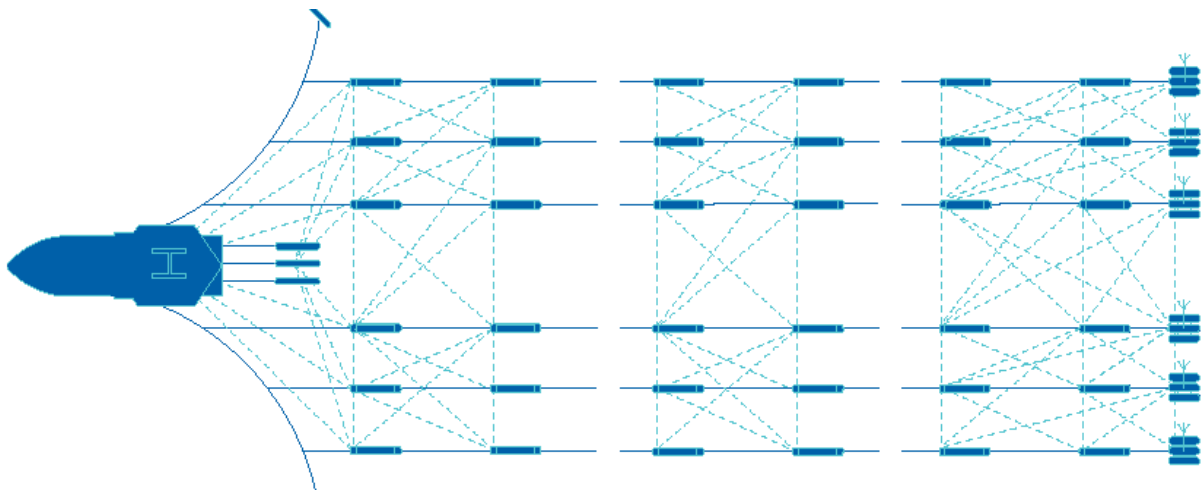
Established in 1971, Sonardyne is an international group of companies manufacturing subsea instrumentation. We specialise in the use of sound for underwater navigation, positioning, data communication and control. Applications for our technology are found within the offshore oil exploration, construction, drilling and oceanographic industries. In many of these areas, the products we have developed and the techniques we have pioneered have become the industry standard.

Modern 3D seismic operations involve large vessels towing long, wide hydrophone arrays. The challenge this presents is to maintain positioning accuracy in the acoustically hostile conditions created by the ship's wake and deafening noise from the seismic airguns and for the acoustic equipment to survive in the high shock environments.

SIPS from Sonardyne was the first system to reliably meet these challenges. Within 3 years of the system's launch, a market leading position was achieved along with a prestigious technology award.

SIPS 2, the latest system, optimises tone and digital ranging techniques to provide full streamer acoustic positioning on the largest of spreads. Ocean Bottom Seismic surveys require the positioning of hundreds of survey points on hydrophone cables using acoustics, in water sometimes only knee deep, all within tight cost constraints. Sonardyne's TZ/OBC system uses a network of low cost, rugged transponders that can withstand fast deployment through mechanical 'squirters'. Transponders and cable sections can be tracked by the novel application of passive radio tag technology.

The end result provides users with a more efficient method of collecting the positions of thousands of seabed hydrophones in real-time and in water depths from 1 to 500 metres. Certified to ISO 9001:2000, Sonardyne's manufacturing facility is in the UK with regional companies strategically located around the world providing sales, product support and equipment servicing. This is backed by a world-wide, 24hr helpline that provides emergency telephone assistance for all Sonardyne's products.



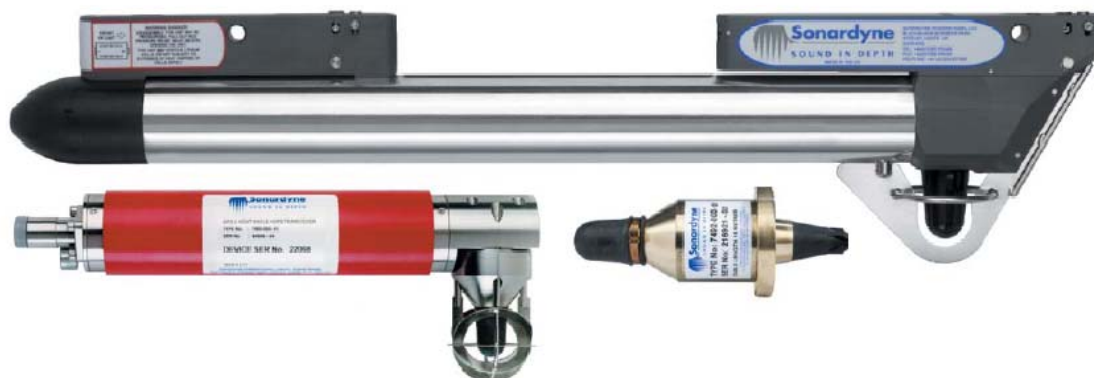
Introduction

SIPS 2 (Seismic Integrated Positioning System) is the latest generation seismic source and streamer positioning system from Sonardyne designed to meet the operational requirements of modern survey vessels towing long, dense arrays.

Acoustic transceivers attached to each streamer, air gun and tailbuoy/navbuoy measure ranges between each other and the survey vessel, enabling both the shape of the towed array to be known and the position of the hydrophones, relative to the vessel to be precisely determined.

SIPS 2 is capable of handling large, complicated arrays with a high immunity to noise and bottom bounce. The Digital Signal Processing architecture offers a greater range resolution and allows many more ranges to be collected and processed in a single shot point.

An additional analogue 'tone-burst' modulation mode ensures reliable operation in the harshest of acoustic environments, as created by ship's wakes and gun arrays. To improve the efficiency of streamer deployment and recovery operations, SIPS 2 can be integrated with Sonardyne's radio frequency asset tracking system. See page 12 for more details.



System Overview

A typical SIPS 2 system comprises acoustic positioning transceivers attached to the streamer, sources and tailbuoys, transceiver controller rack and a computer running Windows-based software.

XSRS

XSRS' are streamer-mounted transceivers that measure acoustic ranges to adjacent XSRS'. The units are battery powered and are typically spaced at 100 metre intervals within the front, middle and tail sections of the array. A typical 6 x 8 kilometre long streamer spread, for example, will require 42 XSRS units to derive a position solution with range redundancy.

Each XSRS has 4 receive channels and 1 transmit channel allowing simultaneous ranging between transceivers and the capability to receive 4 of 60 unique digital signals. Range data is transmitted to the vessel via the inductive coils contained within each streamer. Where a long battery life is required, the Type 8005 XSRS provides users with the option of using alkaline or lithium 'D' size cells.

Sound Velocity Option

Also available within the XSRS product range is the Acoustic Sound Velocity XSRS which incorporates a direct reading sound speed sensor. This 'time of flight' sensor provides superior accuracy and ease of use compared to the more traditional CTD methods, particularly in areas affected by fresh water and salt water mixing.

HGPS

The Head and Gun Positioning System (HGPS) comprises of shock-mounted acoustic transceivers designed to position the seismic sources and tailbuoys.

The units are able to withstand the hostile environment around airgun and can be supplied with different transducer arrangements to accommodate an operator's preferred deployment method.

RTS

Where it is not possible to run a communications and power cable between an HGPS or XSRS and its vessel-based controller, a Radio Telemetry System (RTS) is available. This utilises a ruggedised marine radio in a splashproof enclosure to telemeter range data to the survey vessel.



Controller Rack

The Controller Rack is a 19" rack mounted unit that provides the interface between the in-water acoustic devices and the user's PC. As the slots of the rack are not designated for a particular board type, it can accommodate a total of 6 Controller Cards of any combination (XSRS or HGPS).

Each XSRS Controller Card can support up to 4 streamers with a maximum of 30 XSRS transceivers per streamer. Each HGPS/RTS Controller Card can communicate and provide power to 8 transceivers

Computer and Software

The Navigation Computer is a powerful, purpose-built PC that is interfaced to the SIPS Controller Rack via a serial communications link. It is responsible for processing the raw range data collected by the Controller Rack and passing it to a client's main navigation computer so that an absolute network solution may be obtained.

The unit has been specifically designed to run Sonardyne's family of software applications and features front-mounted USB ports for when access to the rear of the unit is restricted by rack mounting.

A 15" TFT rack-mountable monitor and USB keyboard with integral touchpad is supplied as standard.

Standard software features include XSRS transceiver and HGPS communication tools and acoustic signal diagnostics. These help minimise job setup time and enable rapid QC checks to be made. It also means the acoustic positioning system can be optimised to the survey vessel and its particular operating environment whether in deep water or shallow.