

Introducing the SeaTrac series of Micro-USBL tracking and data modems. Built around a robust broadband spread spectrum signalling scheme, these multi-purpose acoustic transponder beacons are capable of simultaneously tracking asset positions and undertaking bi-directional data exchange.



SeaTrac X010



SeaTrac X110



SeaTrac X150

re-attempting transmission in event of packet loss.

Use of the X150 USBL beacons will allow the interrogating end of the link to obtain a relative position of the remote modem during data exchange, while X010 & X110 beacons will provide distance between modems.

Integrated beacon sensors (such as depth, attitude and supply voltage) may also be remotely queried by the interrogating modem.

AHRS

X150 and X110 beacons are fitted with a 9 Degrees-of-Freedom (DOF) Attitude and Heading Reference System, taking data from the onboard MEMS gyroscope, accelerometer and magnetometer to produce pitch, roll and yaw information that is made available to external applications via the communications port.

Position Tracking

When used in a tracking application, one X150 is mounted from the supervisor vessel, and connected to a PC running the SeaTrac PinPoint display and logging software. All positions are computed by the X150 beacon, so no additional PC hardware is required.

Sub-surface assets to be tracked (including Divers, ROV's, AUV's etc) are fitted with an X010 or X110 beacon, and optionally may use the data port to provide periodic acoustic communications with other systems and sensors.

In this mode up to 14 other beacons may be tracked at ranges up to 1km from the supervisor, with the position of each being optionally broadcast to others in the network.

Data Modems

In a modem application, beacons are mounted at either end of the required data links and addressable packets of data are exchanged between the Acoustic Communication Stacks using protocols that ensure integrity of data, buffering and

Applications

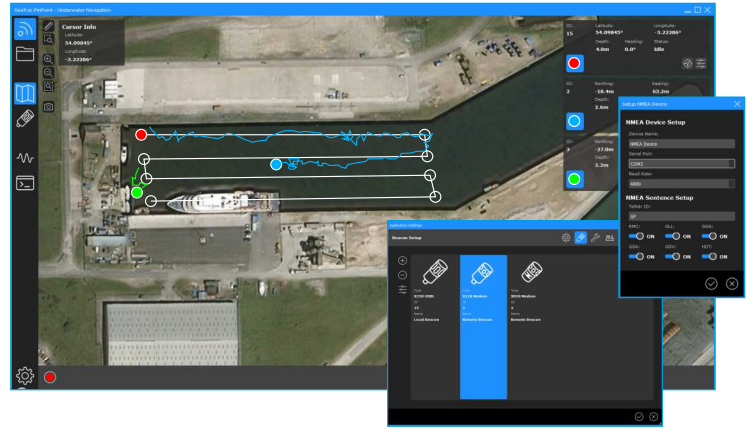
- Multi-beacon tracking system (for small to medium ROVs, AUVs, Divers etc).
- Remote control and interrogation of sub-sea equipment
- AUV/Diver telemetry links
- Remote depth, attitude and orientation measurement.



PinPoint

PinPoint is a Windows software application that allows users to track up to 14 underwater assets, each fitted with a SeaTrac acoustic beacon, from a single USBL beacon.

PinPoint has a variety of features to help users perform positioning, navigation and survey tasks, including the logging and playback of operational data, interfaces to satellite positioning systems, geographic markers, waypoint and destination navigation information and real-time data output to other NEMA compatible systems.



Specifications

Mechanical	SeaTrac X150 BP00795	SeaTrac X110 BP00843	SeaTrac X010 BP00977
Length	132mm (5.2") exc con 160mm (6.3") inc con	106mm (4.2") exc con 134mm (5.3") inc con	74mm (2.9")
Diameter	54mm body, 59mm cage		
Weight	720g in air 530g in water	690g in air 500g in water	300g in air 170g in water
Depth Rating	100m, 300m, 1000m, 2000m		300m
Construction	316 Stainless Steel and Black ABS plastic		
Operating Temp Range	-5°C to +40°C (23°F to 104°F)		

Electrical

Connector	Teledyne Impulse MCBH-5-MP (5-way)	Teledyne Impulse IE55 (4-way)
Communications	Single RS-232	
Supply Voltage	9-28VDC	
Power Consumption	approx 0.6W when idle, approx 6W when transmitting	
Integrated Sensors	Water Pressure & Temperature, 3-axis MARG, Supply Voltage	
Attitude & Heading	Internal 9-DOF AHRS with $\pm 1^\circ$ Yaw and $\pm 0.2^\circ$ Pitch & Roll std-deviation *	N/A

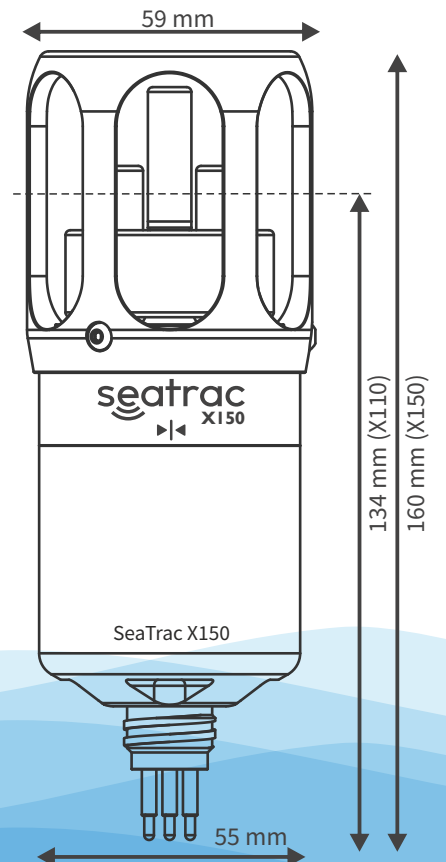
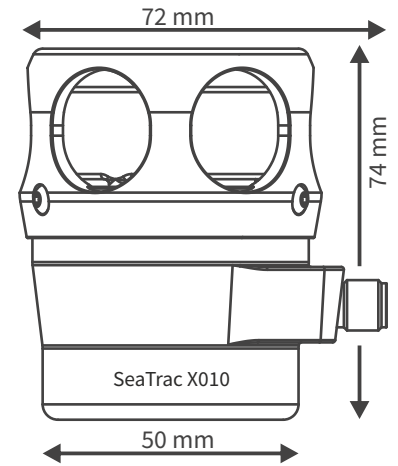
Acoustic

Ranging	Yes	Yes	Yes
Positioning (USBL)	Yes	No	No
Acoustic Range	1km radius horizontal, 1km vertical (hemispherical)		
Range Resolution	$\pm 0.1m$ (dependant on provided VOS accuracy) *		
Angular Resolution	typ 2% of Acoustic Range * ($\sim \pm 1^\circ$)	N/A	N/A
Velocity-of-Sound Range	1300ms ⁻¹ to 1700ms ⁻¹ (can auto-compute from water temp & depth)		
Beacon Velocity	Active Doppler compensation, up to 15kts (28kph)		
Communications	Broadband spread spectrum encoding, 24-32kHz, 100 baud. Multi-tiered Acoustic Protocol Stack.		
Targets (Addressing)	15 unique beacon identifiers, broadcast to all capability. Allows up to 14 targets to be tracked from a single X150 USBL beacon.		

Applications

Supported Software Platforms	SeaTrac NavPoint Software SeaTrac Beacon Management Software
Developers/Integrators	SDK, including ASCII based serial interface with Application level and Acoustic Protocol Stack level commands for third party integration.

DA-140-D00233-06



* indicates value obtained from in-field testing with a data set of 1200 fixes from 22 positions, taken in enclosed area of water 380m x 160m x 10m.
Please note that all functions & specifications may be subject to change in line with our policy of continual product development.



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