Acoustic Positioning

Discover Our Full Suite of Positioning Technology

TELEDYNE MARINE
BENTHOS
Everywhere**you**look™

How and Where is Teledyne Positioning Used?

The Benthos Advantage: Reliable, Cost Effective & Flexible

Reliable: Teledyne Benthos prides itself on a long and distinguished history of providing highly reliable acoustic technology for a wide array of applications.

From acoustic positioning, to acoustic communications (A-COMMS) to acoustic releases, Benthos has been delivering highly innovative, proven solutions for decades, and continues to develop new solutions to tackle the industry's toughest challenges. Whether used stand-alone or in conjunction with each other, customers from around the globe count on these technologies to get the job done.

Cost Effective: We understand there's no one size fits all solution when it comes to positioning, that's why we offer customers an expansive list of products, features and configurations to ensure we have a solution that meets your unique needs - and budget.

Flexibility: Teledyne Benthos acoustic products share the same core technology and common communication protocol, allowing our customers to choose the right products and components to easily and economically modify or expand their system capabilities to meet their specific mission requirements.
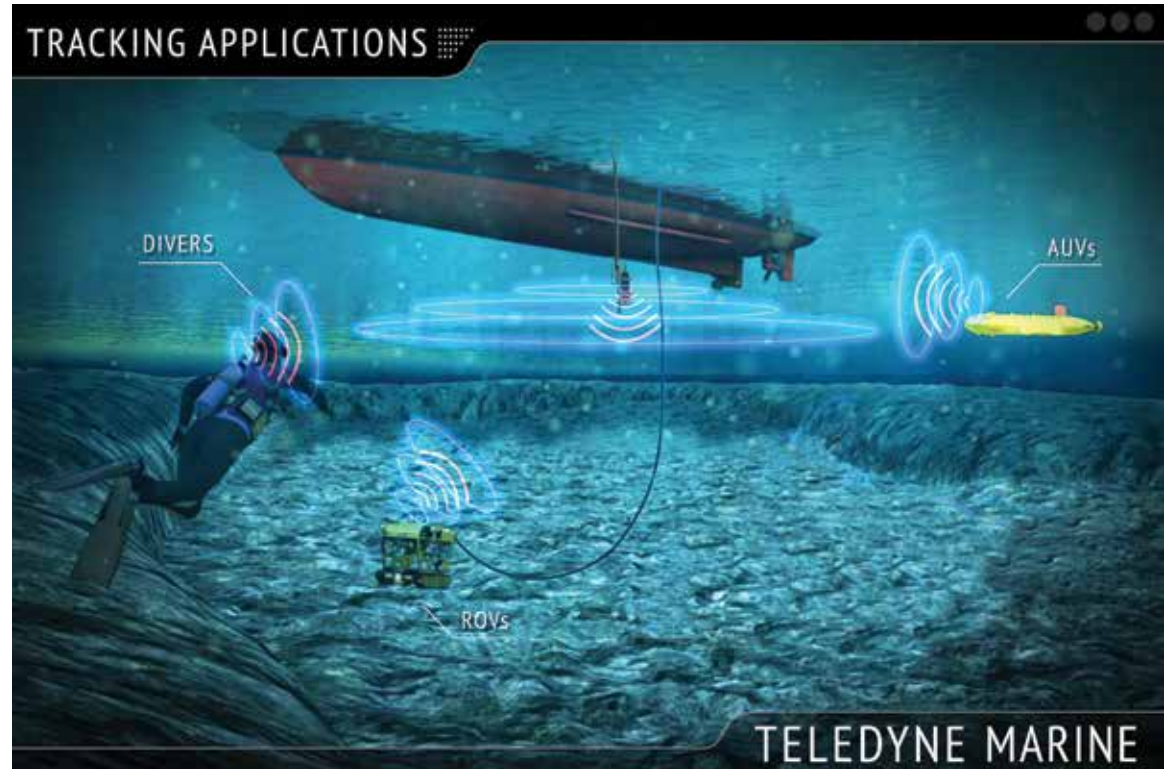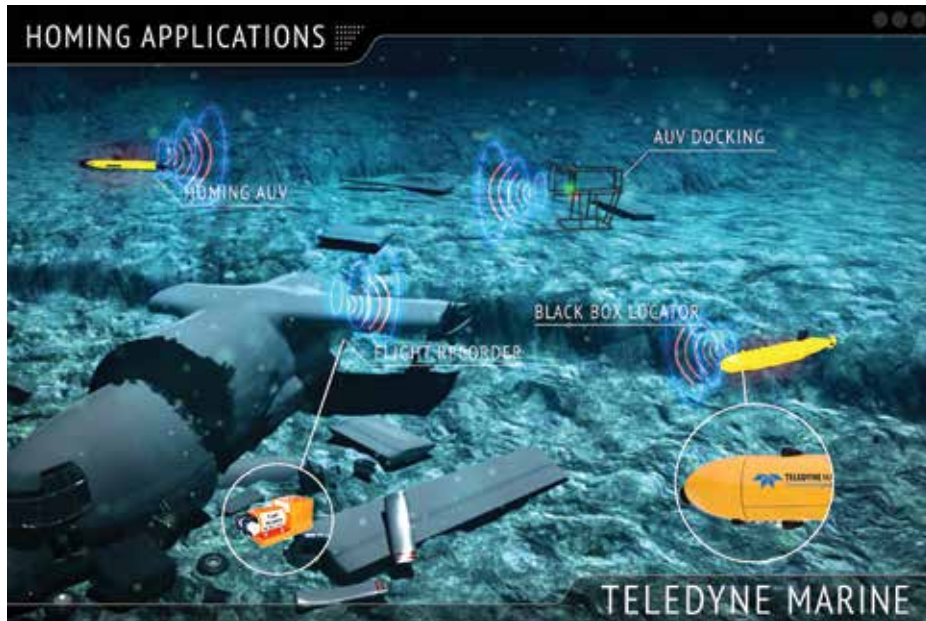

Tracking Applications

One of the most common uses of Teledyne Benthos positioning products is for traditional vehicle and diver tracking applications. Benthos acoustic transponders (with or without A-COMMS capability added), can be installed on various subsea platforms to track their locations relative to the surface. In this instance, a Benthos DAT (Directional Acoustic Transponder) is deployed from a vessel of opportunity and is able to track the location of assets such as:

- **Divers**

- **Remotely Operated Vehicles (ROVs)**

- **Autonomous Underwater Vehicles (AUVs)**

- **Manned Submersibles**

How and Where is Teledyne Positioning Used?

Homing Applications

Teledyne Benthos positioning products can be used to locate and "home in" on subsea assets. This capability is required for numerous applications. Examples shown above include:

- **AUV Docking** - Benthos DATs and transponders can be used in conjunction to guide subsea vehicles to precise locations.

- **Black Box (flight recorder) Location** - When searching a debris field, a surface ship, or in this instance an AUV, can be equipped with a specialized Benthos OEM DAT to home in on a black box pinger like those installed on all airline flight recorders.
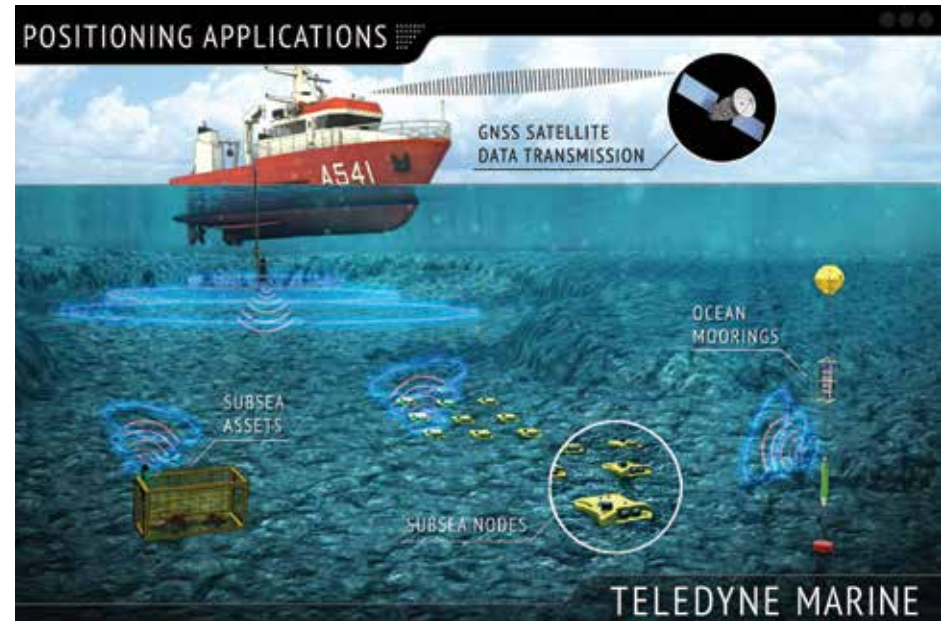
Positioning Applications

Teledyne Benthos acoustic systems can be used stand-alone or in conjunction with each other to serve a wide array of traditional and more unique positioning applications. In the example above, a Benthos DAT is deployed from a ship of opportunity to locate and/or communicate with the following:

- **Subsea Assets** - Acoustic transponders, releases or modems can be installed on subsea assets to allow for their location and recovery. In this instance, a Benthos acoustic transponder with A-COMMS capability is installed on a lobster trap to enable ropeless fishing.

- **Subsea Nodes** - Benthos acoustic transponders with A-COMMS can be installed on subsea nodes for subsea positioning and to relay health, status and sensor data.

- **Ocean Moorings** - Using Teledyne Benthos Trackit software and a DAT, acoustic releases can be quickly and efficiently located for mooring recovery without the need to collect multiple survey points.
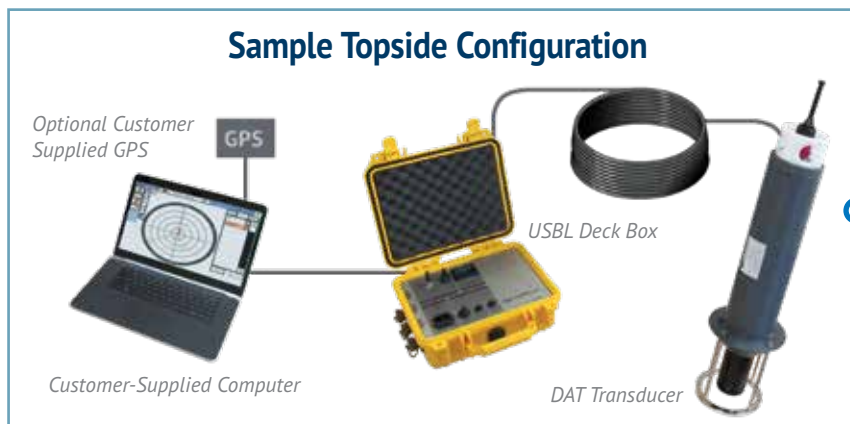
Example Configurations

Positioning can be achieved using a mix of Teledyne Benthos products and technologies utilizing a common frequency band.

Select your application below to find typical corresponding product solutions to the right.

Other configurations available. Contact us to customize your solution.

Category	Application	DAT (Housed)	DAT (OEM)	Trackit Software (on customer supplied PC)	Trackit Deckbox	Transponder ATM, CM, or UCM	A-COMMS Option	Transponding Release
Tracking	Diver	●		●		●	●	
	ROV	●		●		●		
	AUV	●	●	●	●	●	●	
	Manned Submersible	●	●	●	●	●	●	
Homing	AUV into Charging/Data Transfer Dock	●	●			●	●	
	Black Box Pinger Locator		●		●			
Positioning	Ropeless Fishing	●		●	●	●	●	
	Ocean Mooring	●		●	●			●
	Subsea Nodes	●	●	●	●	●	●	

Sample Topside Configuration

Optional Customer Supplied GPS

GPS

USBL Deck Box

Customer-Supplied Computer

DAT Transducer

Sample Subsea Assets

Acoustic Release

ATM 916

Ultra Compact Modem (UCM)

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Positioning Products

Directional Acoustic Transponder (DAT)

Directional Acoustic Transponder (DAT)
All-In-One: Range, Bearing, and Data Communication

The USBL DAT Transponder is the heart of Teledyne Benthos positioning system. It's available in self-contained or OEM configurations and can be deployed from the surface over the side fastened to a user-supplied deployment pole using the optional aluminum mounting sleeve, or subsurface for homing applications.

The DAT transmits its broadband interrogation signals, which are received by one or more USBL Transponders, Modems or Acoustic Releases. Replies are received by the USBL DAT sequentially and the system calculates the range and bearing to each asset.

*The position and bearing accuracy specifications apply only to a stationary USBL Transducer. For vessel mounted applications, an external MRU & GPS can be added to the Trackit software to provide pitch, roll and heading for increased accuracy.


OEM board set kit (options)

DAT Key Specifications	
Range Accuracy	Range 0.3 m, Angle ± 0.3° RMS
Position Accuracy	±0.5% of slant range*
Beamwidth	Receive – azimuth 360°, vertical ± 50 degrees
Depth	500 m, 2 km, and 6 km housing options
Power	300 W•Hr internal batteries (can also be externally powered)
A-Comms Range	LF: ≥ 6 km Typical MF: ≥ 4 km Typical Band C: ≥ 2 km Typical
Frequencies	LF: 9-14 kHz MF: 16-21 kHz Band C: 22-27.5 kHz
Transducer	Transmit omni-directional (Toroidal pattern). Remote and faired transducer options available.
Data rate	80 - 2400 bps standard; up to 15,360 bps with optional PSK co-processor
Data Storage	6 MB standard, SD Datalogger option adds additional 4 GB

OEM Kits	
Kit Includes	PCB on chassis (long/short option); Remote transducer (straight/right angle option); Interface pigtail

Graphical User Interface (GUI)

The Trackit USBL GUI is a software program that runs on a Microsoft OS based computer with RS-232 serial port.

The software communicates with the topside DAT and tracks remote assets by receiving range, bearing, and elevation from the subsea assets. The program takes in an external GPS feed and uses a combination of the GPS and the range and bearing data to calculate the location of the subsea targets. Subsea assets can be surveyed, tracked, and plotted on a live map display screen for a visible USBL solution. The system can track up to 250 addressable transponders in sequence and can communicate with up to 6 devices simultaneously.
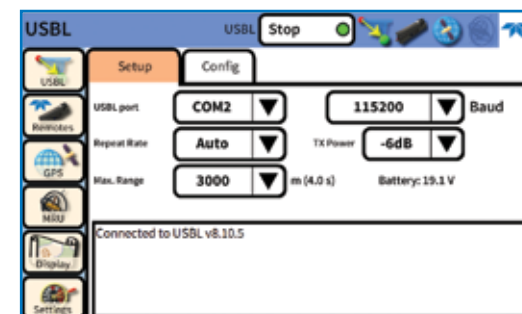
User-friendly control screen to quickly step users through the system set up.

Display screen shows radar view.

Positioning Products

Acoustic Communications

Our full line of acoustic modems can be utilized as transponders for positioning applications as well as for wireless data transmission, delivering yet another key benefit to positioning applications.

Available in a series of frequencies, depth ratings, and configurations, you're sure to find a solution to meet your budget and your needs.

R-Series Acoustic Releases

Teledyne Benthos full line of acoustic releases employ the latest in digital signal processing (DSP) technologies, allowing them to operate in conjunction with our DAT to calculate mooring position, receive system commands, and transmit system status and other critical data to ensure the health and integrity of your mooring.

Trackit Deckbox (Optional)

For those looking for portable topside power and control, the optional Trackit Deck Box provides power to the DAT and interfaces it to your PC over an RS-232 serial interface or a Bluetooth data link, switchable between the two. The unit includes a rechargeable lithium battery, removing the need for external power.

Key Modem Specs		
UCM	**CM**	**ATM**
Power 12-36 VDC	7-14 VDC	12-36 VDC
Range	LF: ≥ 6 km Typical MF: ≥ 4 km Typical Band C: ≥ 2 km Typical	
Positioning Technology	Broadband spread spectrum	
Frequencies	LF: 9-14 kHz MF: 16-21 kHz Band C: 22-27.5 kHz	
Depth Rating	**Self-contained**	
700 m OEM up to 6000 m	1000 m OEM up to 6000 m	500 m, 2 km, 6 km OEM up to 6000 m

R Series Specs	
Depth Rating	500 m, 2 km, 12 km
Slant Range Accuracy	0.3 m (1 ft)
Tilt Range	0-180° at 1° increments
Operating Life	18 months to 4 years
Frequency Band	9-14 kHz

Trackit Deckbox Specifications	
Interface	RS-232 and Bluetooth
Serial Cable Length	1.5 m (5 ft)
Transducer Cable Length	25 m standard
Temperature, Operating	-5°C to 40°C (23°F to 104°F)
Display	Battery Voltage Display
Weight	3.2 kg (7.0 lb)
Power Input	110-240 VAC; 50/60 Hz

Turnkey Trackit System and Available Options

Trackit Deck Box
Includes 25m Deck Cable

Trackit Software
Runs on Windows Based PC

DAT Mounting Sleeve
for Pole Mount

Deck Cables
Various lengths are available for when the Deck Box is not used

Transponders
Different models to suit various applications

Portable Transport Case.

All-In-One Trackit System Kit
A complete basic system with everything you need to track a subsea asset from a vessel or other platform – all in a single, portable transport case.

Please contact your Teledyne Marine sales representative for additional Systems and Products for Positioning and Tracking Applications.

GNSS Data Feed

MRU Data Feed

Trackit Deck Box and software

Optional faired transducer for AUV applications

DAT with optional mounting sleeve deployed on customer supplied pole mount

About Benthos

Teledyne Benthos designs and manufactures field-proven, leading-edge acoustic systems built to take on the most challenging marine environments. Whether used stand-alone, or in conjunction with each other, Teledyne Benthos acoustic communications, acoustic recovery and acoustic positioning products continue to deliver proven reliability, flexibility and value.

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