TrackLink 1500

Integrated USBL Tracking and High Speed Acoustic Communication Systems

Highly Robust , Accurate and Cost Effective
The World's Best Selling USBL Acoustic Tracking Systems

The TrackLink 1500 systems are USBL acoustic tracking systems with fully integrated high speed acoustic communication capability. Capitalizing on its benchmark **Broadband Acoustic Spread Spectrum (BASS)** technology, LinkQuest provides the end users with solutions for underwater tracking and communication at sharply reduced cost and increased robustness. An extensive line of models are available to suit the users' specific application and budget constraint.

Since their introduction in early 2002, the TrackLink acoustic tracking systems have quickly become the best selling USBL tracking systems in the world. The TrackLink 1500 systems, sold to more than 12 countries in less than a year, have become the world's primary choice for tracking underwater vehicles and objects in water depth of less than 1000 meters.

The cost of a complete system, including a ship mounted transceiver, a transponder, the PC tracking software, a 70 foot cable and a transit case, starts from 15,000 US dollars.

TrackLink 1500LC

This system is a low cost yet highly robust system. This system brings the convenience of an USBL system to a large number of users who typically do not have the budget for an expensive USBL tracking system.

TrackLink 1500MA

This system is a cost-effective, medium accuracy tracking system. The accuracy of the system is 1 degree. The TrackLink 1500MA System provides a highly robust solution to cost conscious users who require improved positioning accuracy.

TrackLink 1500HA

This system is a high accuracy USBL tracking system. The accuracy of the system is 0.25 degree.

Main Features

- Sharply reduced cost to end users and improved system robustness.
- Utilize LinkQuest's benchmark **Broadband Acoustic Spread Spectrum (BASS)** Technology.
- Strong rejection to multipaths and ship noise.
- Integrated with LinkQuest's most advanced high speed acoustic communication modems.
- Advanced power-efficient DSP technology for transponders and USBL transceiver.
- PC Windows tracking software. Interface directly to the transceiver. No need for a heavy proprietary deck unit.
- Small and light weight transceiver for ease of installation on a ship.

System Specifications

- Positioning Accuracy:
  - 1500HA: 0.25 degree (better than 0.5% of slant range)
  - 1500MA: 1 degree (better than 2% of slant range)
  - 1500LC: 3 degrees (better than 5% of slant range)
- Slant Range Accuracy: 0.20 meter
- Targets Tracked: 16
- Operating Frequency: 31.0 to 43.2 kHz
- Operating Beamwidth: 120 to 150 degrees
- Transmit Mode Power Consumption: 10 Watts
- Receive Mode Power Consumption: 1.6 Watts
- Working Range With Ship Noise: up to 1000 m
- Maximum Transponder Depth: up to 1500 m
- Dimension: 12.6 cm (diameter) x 24 cm
- Operating Temperature: -5 to 45 ˚C
- Storage Temperature: -25 to 75 ˚C
- Weight Out Of Water: 3.5 kg
- Weight In Water: 1.2 kg
- RS-232 Configuration: 9600 baud, 1 start bit, 1 stop bit, no parity bit, and no flow control
- Optional High Speed Acoustic Modem Data Rate: up to 19,200 baud
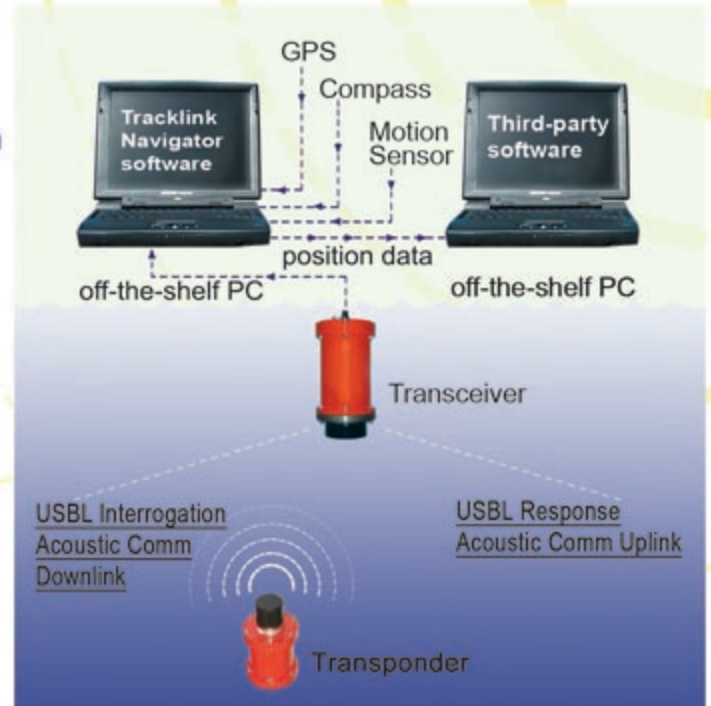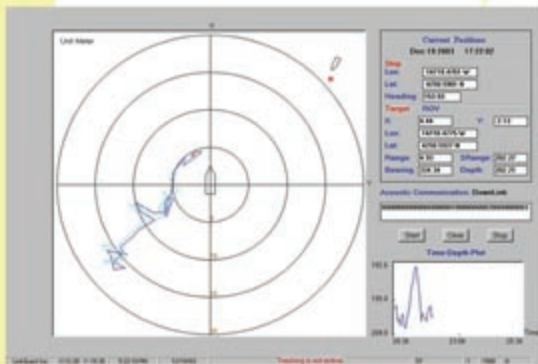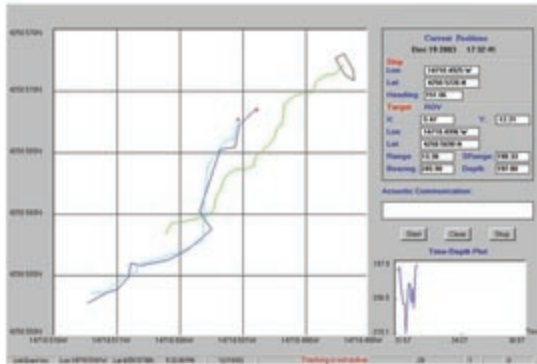- Acoustic Modem Operating Frequency: 26.0 to 45.0 kHz

LinkQuest Inc.

TrackLink 1500 Transceiver And Software

Applications

- ROV Tracking and Navigation
- AUV Tracking and Communication
- Manned Submersible Tracking and Communication
- Survey Towfish Tracking
- Underwater Construction
- Diver Navigation and Tracking
- Moored Instrument Relocation

GPS
Compass
Motion Sensor

Tracklink Navigator software

Third-party software

off-the-shelf PC

position data

off-the-shelf PC

Transceiver

USBL Interrogation Acoustic Comm Downlink

USBL Response Acoustic Comm Uplink

Transponder

The TrackLink Navigator Windows software integrates the TrackLink USBL transceiver with the ship's GPS/DGPS, compass and motion sensor using serial communication. The software displays the positions of the ship and the targets in various plots and textual displays. It also interfaces to other computers for acoustic communication data and sends positioning data to other computers in a predefined format.

The TrackLink software works smoothly with third party software such as HYPACK™, WinFrog™ and HYDROpro™.

The TrackLink Navigator software runs on any off-the-shelf PC. No cumbersome "Deck Unit" is needed to operate the system. The software is simple to use and highly robust. A few clicks from the mouse will start your tracking session smoothly.

The industry's smallest and lightest USBL transceiver
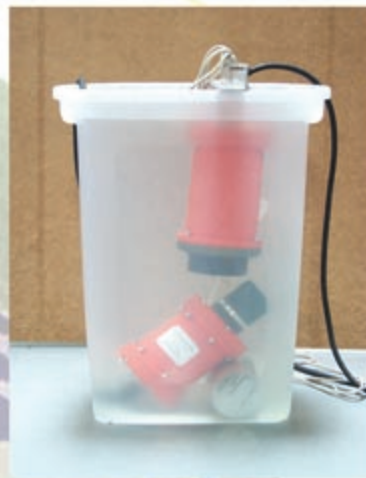
The industry's only USBL systems capable of tracking targets in highly challenging acoustic environments inside small containers

LinkQuest Inc.
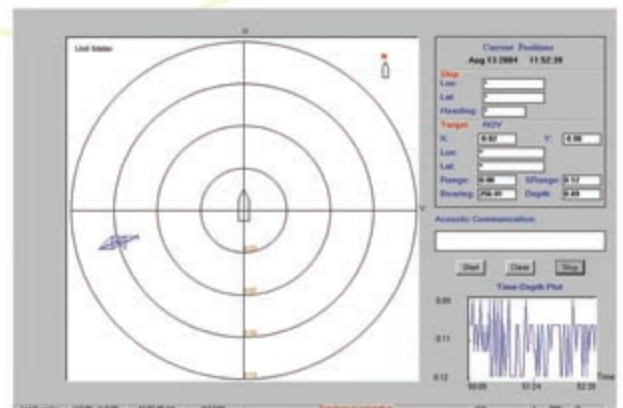
TrackLink 1500 Series
Intelligent, Power Efficient Transponders

(left to right) TN1522 Responder, TN1505B and TN1505BR Transponders, TN1510A, TN1510B and TN1510C Transponders.

A wide range of transponders are available for the TrackLink acoustic tracking systems. All the transponders use state of the art DSP to manage the power usage efficiently. The **Broadband Acoustic Spread Spectrum** technology used by the TrackLink system further decreases the power consumption. The DSP is programmed to stay in the standby mode most of time and wakes up to intercept acoustic signal periodically. After the transponder is awaken by the surface TrackLink transceiver, it will be transitioned to the active mode and ready to respond to surface transceiver interrogation. The transponder will go to the standby mode after a prolonged period with no signal reception.

Each transponder has 8 configurable addresses stored in the flash memory and the user can conveniently use the RS232 interface to configure the addresses and other parameters. TN1510 is a high power omni-directional transponder. It uses addresses from 1 to 8. It has comprehensive integrated acoustic communication functions. TN1505 is a high power compact omni-directional transponder. It uses addresses from 9 to 16.

Model A (e.g., TN1505A) is a compact transponder with no batteries. Models B and C for the TN1505 transponder use alkaline AA battery cells. Model B for the TN1510 transponder is equipped with alkaline C cells for medium term field use. Model C for the TN1510 transponder is equipped with alkaline D cells for long term field use. All transponders operate at frequency band from 31.0 to 43.2 KHz.

TN1510 transponder/responders have a high power option which increases the transmit power by 6 dB. This option can be useful for long-range high noise environments. The letter "H" following the model number, e.g. TN1510BH, indicates the transponder has the high power option.

All models also have a remote transducer option. With this option, the transducer is connected to the electronics housing by a cable. The letter "R" following the model number, e.g. TN1505BR, indicates the transponder has the remote transducer option. All transponders can be configured to act as a responder. All internally powered transponders can also be powered externally. If the external power is cut off, the transponder will automatically switch to use the internal battery.

TN1505

Transmit Power: 25 Watts
Beamwidth: omni-directional
Depth Rating: 500 m

1505A:
Dimension: 25 cm x 6.4 cm (d)
Weight in Water: 0.6 kg
Weight out of Water: 1.4 kg
Input Voltage: 12 to 24 v

1505B:
Dimension: 30 cm x 6.4 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 1 year
Active Responding Time: 8 x 10 hours
Weight in Water: 0.86 kg
Weight out of Water: 1.77 kg
Input Voltage: 18 to 24 v

1505BR:
Dimension: 24 cm x 6.4 cm (d)
Weight in Water: 0.65 kg
Weight out of Water: 1.45 kg

1505C:
Dimension: 43 cm x 6.4 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 2 years
Active Responding Time: 8 x 30 hours
Weight in Water: 1.2 kg
Weight out of Water: 2.4 kg
Input Voltage: 18 to 24 v

TN1510

Transmit Power: 32 Watts
Beamwidth: omni-directional
Depth Rating: 1500 m

1510A:
Dimension: 23 cm x 12.6 cm (d)
Weight in Water: 1.4 kg
Weight out of Water: 3.2 kg
Input Voltage: 12 to 24 v

1510B:
Dimension: 41.3 cm x 12.6 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 10 months
Active Responding Time: 8 x 25 hours
Weight in Water: 2.0 kg
Weight out of Water: 5.2 kg
Input Voltage: 22 to 24 v

1510C:
Dimension: 46 cm x 12.6 cm (d)
Battery Storage Time: 3 years
Battery Operation Time: 20 months
Active Responding Time: 8 x 50 hours
Weight in Water: 2.8 kg
Weight out of Water: 6.8 kg
Input Voltage: 19 to 24 v

Options:
Integrated Acoustic Modem
High Power

The omni transponders and responders are also available in various special models. Contact LinkQuest for more details.

TrackLink 1500 Systems Set Enviable Track Record Worldwide

Fugro Chance, Fugro Survey B.V., Fugro Topnav S.A.S., Fugro Geonics, Fugro UAE, Fugro Survey Africa, Fugro S.A.E. Egypt and other Fugro companies worldwide have purchased over 25 TrackLink 1500 systems for offshore oil field applications.

Saab Seaeye (*www.seaeye.com*) orders a large number of TrackLink 1500 systems for ROV tracking by its worldwide customers.

Connolly-Pacific used the TrackLink system in its 3-month construction project in the coastal Pacific Ocean near Newport Beach, California. Connolly-Pacific surveyed the 1.3 km long sewage pipeline and laid 53,000 tons of rocks along side the pipeline to secure its positions. The TrackLink 1500MA system provided all acoustic positioning functions such as diver tracking, DOE Phantom ROV tracking and tracking of various underwater structures along with the pipeline during the construction.

Courtesy of Connolly-Pacific

Lockheed Martin uses TrackLink 1500HA and inverted TrackLink 1500 systems for ROV tracking and AUV navigation.

Odyssey Marine Explorations Inc. (*www.shipwreck.net*) used the TrackLink system in its discovery of the sunken remains of the S.S. Republic that could yield the richest cargo ever recovered from a shipwreck: thousands of gold coins worth as much as $180 million.

US Navy SPAWAR used the TrackLink system to track unmanned underwater glider.

SeaBotix of San Diego, California (*www.seabotix.com*) purchased 6 TrackLink 1500LC systems to be equipped on their LBV ROVs purchased by a US Navy EOD unit in Europe.


Courtesy of Odyssey Marine Exploration

Courtesy of SeaBotix Inc.

Shark Marine, ECA Robotics, Sub-atlantic, Seamor Marine, Hydroacoustics, Ageotec, Outland Technology and other ROV manufacturers order a large number of TrackLink 1500 systems for their ROV customers worldwide.

Onyx Special Services Inc. used TrackLink1500 systems to track a Phantom ROV, divers and diving bells in crew oil pipeline inspection and repairing projects in Great Lakes.

Marathon Oil Company uses TrackLink 1500 systems in offshore pipeline construction projects in West Africa.

Alaska Department of Fish and Game (*www.state.ak.us/adfg/adfghome.htm*) uses a TrackLink1500 system to track Phantom ROV in its survey project.
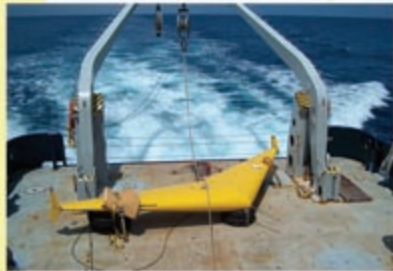
Courtesy of US Navy

Ocean Surveys Inc. of Connecticut (*www.oceansurveys.com*) uses the TrackLink1500 systems to track sidescan sonar, magnetometer, ROV and other towed instrumentation supporting numerous domestic and international marine survey projects.

Elcome Marine Services of India procured 5 TrackLink 1500 systems to track sidescan sonar, sub-bottom profilers and ROVs.

MacArtney A/S of Denmark orders a TrackLink 1500MA system to be installed on Seaeye Marine Ltd.'s Falcon ROV.

Survey Equipment Services of Houston, Texas has included five TrackLink systems in its leasing pool.

Courtesy of Onyx Special Services

CSIRO, Australia, orders a TrackLink 1500HA system along with 4 TN1510B transponders to track towfish and ROV.

Undersea Graphics of California, USA uses TrackLink 1500LC system to track its manned submersible.

Nekton Research LLC of Durham, North Carolina, orders a TrackLink 1500MA system with integrated two-way acoustic communication capability. This system will be used to track the AUV while the operator performs command and control of the vehicle.

NASA orders TrackLink 1500 system along with LinkQuest's 38,400 baud high speed modem for AUV tracking, navigation and communication.

Courtesy of LeBaron Group Inc.

LinkQuest Inc.

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