

Playing it Safe

What kinds of Positioning Systems are available on a VideoRay Pro series ROV?

There are two kinds of positioning systems available on a VideoRay “Tether Based Non-Acoustic, and Acoustic. There are three different kinds of Acoustic systems Long Base Line (LBL,) Short Base Line (SBL,) and Ultra Short Base Line (USBL.) A brief description of the VideoRay implementation for each:

Tether Based Non-Acoustic “this is a new type of positioning system that is currently available only on VideoRay ROVs. The only manufacturer is KCF Technologies, and the brand name is Smart Tether. It uses multiple attitude sensors embedded in the tether and sophisticated modeling to estimate ROV position. When combined with a surface GPS the Smart Tether can provide a geo-referenced sub-sea position. See <http://www.smarttether.com/> for more information. System operation is independent of water properties and acoustic conditions, but can be affected by tether handling. Position update rates on the order of 10 per second are typical.

Long Baseline Acoustic (LBL)“this uses multiple stationary self contained subsea transponders as reference points, typically separated by distances of hundreds of meters. Using a transponder mounted on the ROV, the system calculates ranges from the ROV to the reference transponders from acoustic signal times of flight. Using these ranges and the known locations of the reference transponders, the ROV position can be estimated. If the geographic positions of the reference transponders are known then a geographic position of the ROV can be obtained. A long baseline system can provide the highest quality positioning accuracy. Deployment, recovery, and geo-referencing of the subsea transponders can require considerable time, effort, and operator sophistication. One exception is ship hull surveys, where the reference transponders can be deployed with relative ease. System operation is dependent on water properties and acoustic conditions. Position update rates are on the order of one each second to every 4 seconds. See http://en.wikipedia.org/wiki/Long_Baseline_Acoustic_Positioning_System .

Short Baseline Acoustic (SBL) this is similar to the LBL system, but in this case the transponders are cabled so that typical baseline lengths are 10-20 meters or less. This has the advantage of being easier to deploy than an LBL system, and the reference transponders can move with a surface vessel. Positioning quality can be similar to LBL for positions relatively close to the reference stations. This type of positioning system is rarely used with current VideoRay systems. See http://en.wikipedia.org/wiki/Short_Baseline_Acoustic_Positioning_System .

Ultra Short Baseline Acoustic (USBL)“The distinguishing characteristic of a USBL system is that there is a single reference point, the USBL head, which is deployed off the surface platform. The system acoustically measures range and bearing to the transponder on the ROV. The USBL system has the advantage of typically being the easiest acoustic navigation system to deploy. Geographic position of the ROV can be obtained when used in conjunction with GPS. USBL technology is the most common subsea positioning technology used. VideoRay supports the Tritech Micron Nav (http://www.tritech.co.uk/products/products-micron_nav.htm), and most other systems can be

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easily fitted to a VideoRay.

System operation is dependent on water properties and acoustic conditions. Position update rates are on the order of two per second to one every four seconds. See

http://en.wikipedia.org/wiki/Ultra-short_baseline

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