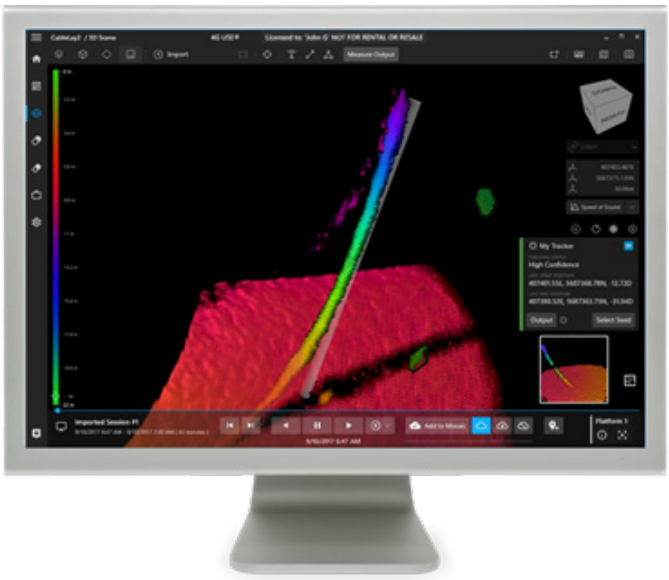
Coda Octopus:3D
Real-Time Sonar Solutions

/3D Multiple Automated Target Tracker (3D MATT)



Benefits

Tracking of multiple targets from one or more Echoscope® or Echoscope PIPE® sonar in real-time

Real-time processing and output of target's location, status and quality with visualization simultaneously

Tracking of 3D cylindrical volumes and known and unknown object point clusters (Line and Point Trackers)

Real-time control of tracking parameters and integration of external positioning and attitude data for comprehensive full 3D spatial tracking solution

Fully automated track logging, output to 3rd party systems and measurement point recording (used for cable lay Touch Down Point logging)

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Automatic target tracking for real-time 3D sonar

The CodaOctopus® 3D Multiple Automated Target Tracking (3D MATT) software technology which is available with 4G USE® and Underwater Survey Explorer (USE) Software Packages is a patented technology (US11,061136 and US11,204108) developed to automate several underwater tasks such as Cable Laying and Monitoring, Vehicle Tracking and broader Object Tracking tasks.

3D MATT is a real-time multiple target tracker using 3D data from our flagship real-time 3D volumetric sonar technology, the Echoscope® and Echoscope PIPE sonar series. The Echoscope® technology is the only sonar that can visualize and monitor moving objects underwater in 3D/4D/6D in all water conditions including zero visibility. In addition, Echoscope PIPE® is the only series of sonar which is cable of generating multiple 3D/4D acoustic images in real time applying different acoustic and filtering parameters (such as range, field of view, pulse length and filters). PIPE Sonars also allow for real time dynamic selection of number of beams and field of view.

3D MATT can track and estimate 3D positions of moving targets in real-time and at a rate of typically 20 pings per second, significantly enhancing real-time positioning applications over traditional acoustic positioning methods in particular given that no hardware or beacons are required to be attached to the target to be tracked.

Any target that can be imaged by the Echoscope® or Echoscope PIPE® is a suitable target for tracking by 3D MATT using one of the available tracking options within the 3D MATT Software. The POINT METHOD in 3D MATT allows tracking of known and unknown dynamic object using available point clusters to determine the center point of the object. This can be used for objects including ROVs, AUVs, Divers, Dredging and Construction equipment. The LINE METHOD in 3D MATT allows tracking and estimation of targets that form a full or partial cylindrical volume that represent dynamic linear and curved lines. This can be used specifically for cable lay, pipe lay and linear structure including pile driving.

In both POINT and LINE tracking methods the user is able to configure the size of the tracked object, the search area around the object and the speed of expected movement. These defined parameters ensure that the object is precisely tracked, and external noise does not degrade performance.

A significant feature of the patented 3D MATT technology is the ability to automatically distinguish the seabed and surfaces within the Echoscope® or Echoscope PIPE® data allowing the tracker to focus only on the target object without background interference. This capability further allows tracking to be referenced to the seabed which is a key feature used in cable lay Touch Down Point monitoring.

Outputs

In addition to real time visualization of the target object using the Echoscope® or Echoscope PIPE® standard software applications Underwater Survey Explorer and 4G USE® software applications, third party survey and control systems can simultaneously receive real-time tracking output and measurements over serial and ethernet connections. Recording of data to log files is also available.

When using the LINE tracker for cable lay Touch Down Point monitoring, the extent of the tracked cable is output in addition to the estimated intersection point on the seabed.

External Sensor Integration

3D MATT is not only capable of computing real-time XYZ (3D point) of the tracked object but is also able to accept external positioning and attitude sensor data to augment or seed the tracking data.

Tracking a diver or underwater robot that has available depth, heading and tilt sensors allows a fully augmented 6DoF to be output by 3D MATT.

The use of an external low update rate positioning system such as USBL or beacon data further allows the 3D MATT system to continue to output positional data when the target is out of the Echoscope® or Echoscope PIPE® field of view. Once the target returns to the field of view, tracking is automatically resumed at higher resolution update rate.

Rotator Integration

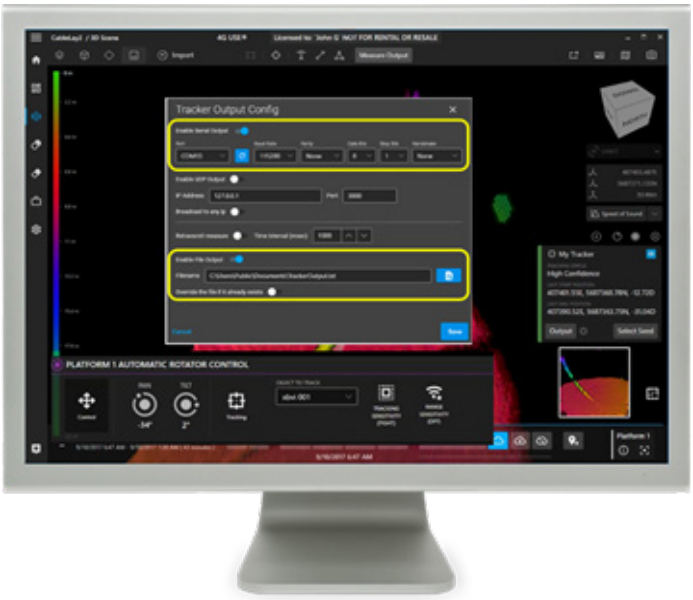
3D MATT is fully integrated with the Coda Octopus family of rotators (Integrated Pan & Tilt (IPT and Integrated Single Axis Rotator (ISAR)) and can automatically control these sensors based on tracking focus. Using the Rotator option provides a completely hands-free operation for users wishing to track a target from either a static or moving platform. The rotator will

Applications

A key application focus for 3D MATT is Offshore Wind Farm construction operations. Here, when performing cable lay operations, the 3D MATT software can automatically track and record cable touch down points, helping to maintain a prescribed and safe steady tension on the cable as the vessel moves. This removes the need for an operator to manually select each touch down point. Automation of this process reduces human errors and frees the operator to use the Echoscope® or Echoscope PIPE® data for other real-time decision-making tasks such as looking ahead of the touch down point for objects and targets in the decision lay corridor, or checking for over/or under tension of the cable.

Other Applications for 3D MATT include:

Autonomous Vehicle Docking Tracking
Dredge Head tracking and monitoring
Block placement
Fish and Schooling tracking
Gas leak rise time monitoring
Small ROV positioning
Seabed construction asset lowering
Pile driving



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