

SeeByte and VideoRay Join Forces for Automated Piloting of MicroROV

New capabilities provide exciting possibilities for low-logistics remotely operated vehicles

By VideoRay LLC and SeeByte

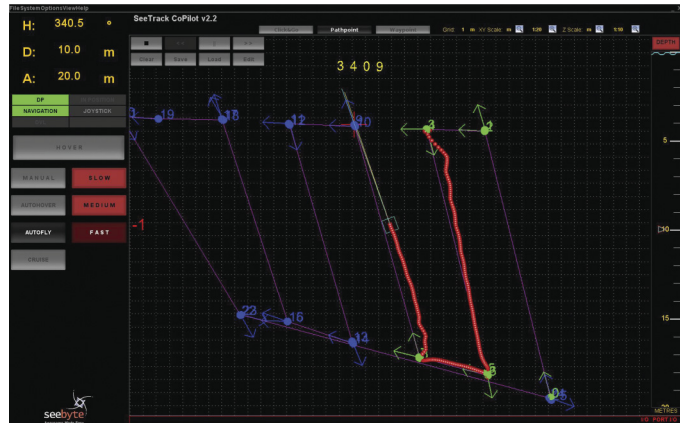
VideoRay LLC, of Phoenixville, Pennsylvania, USA, is a leader in the production and sale of Inspection Class Remotely Operated Vehicles (ROVs). These submersibles – which weigh less than 10kg in air with a full complement of sensors and instruments are used throughout the world for undersea search and inspection and port security. The United States Coast Guard has standardized on VideoRay’s products, as have Navies and Coast Guards in many other countries throughout the world. Sonar and positioning system manufacturers support VideoRay vehicles first, due to VideoRay’s market share and ease of integration. VideoRay will soon deliver its 2,000th system.

SeeByte, of Edinburgh, Scotland, is a leader in software systems for unmanned underwater vehicles, particularly software that provides control of both ROVs and AUVs (Autonomous Underwater Vehicles). SeeByte has provided software for the first autonomous inspection of riser pipes using an ROV without direct pilot control, which is one of the company’s many world first accomplishments. SeeByte has produced software that flies ROVs along pipelines on pre-determined search patterns, and has enabled sonar target-tracking using a BlueView multibeam sonar.

A recent integration of the Teledyne RDI Phased-Array DVL (Doppler Velocity Log) navigation with the VideoRay Pro 4 provided an opportunity to integrate SeeByte’s SeeTrack CoPilot software, for the first time, on an observation vehicle. VideoRay’s Pro 4 line incorporates a Windows-based laptop to drive the submersible and instrumentation in a comprehensive and cohesive manner through VideoRay’s Cockpit software. Cockpit is designed for easy integration of third party software, and many leading vendors of sonars, other instruments, and positioning systems have taken advantage of this. Both VideoRay and SeeByte were eager to see how well SeeTrack CoPilot would work in this environment.

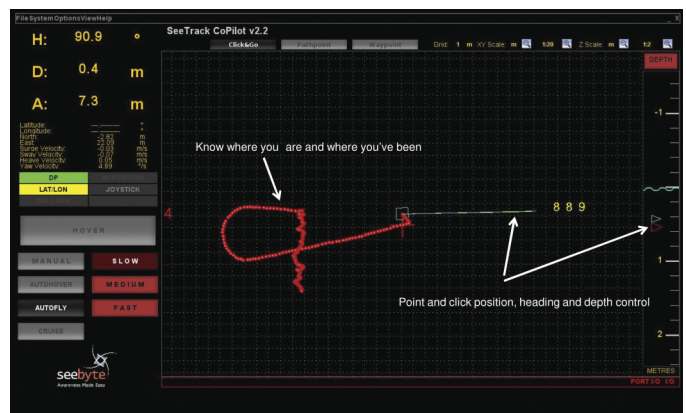


Benjamin Privat, engineer at SeeByte, programs the VideoRay ROVs automated course with SeeBytesCoPilot software (Photo Credit: SeeByte)



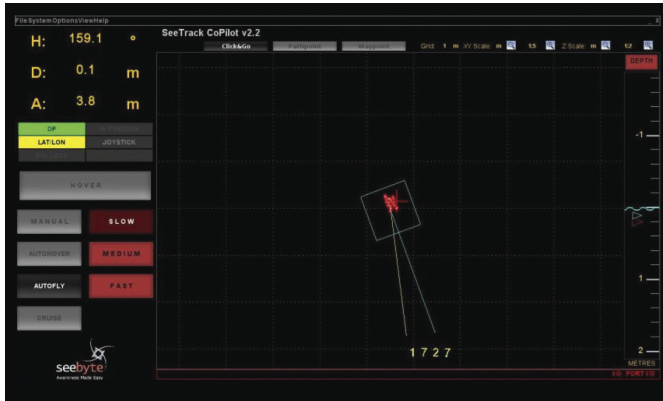
Pre-planned mission drawn and executed. The ROV autonomously runs the route. At any point the ROV can be re-routed with the click of a mouse or manually over-ridden by the pilot. (Photo Credit: SeeByte)

Initial trials produced successful results. The VideoRay Pro 4 completed several automated pre-planned maneuvers and was successfully re-routed from its pre-planned mission through a mouse point and click via the SeeByte CoPilot software interface, which works side-by-side with the VideoRay Cockpit software. Station keeping, an important feature in subsea ROV inspection work, especially in higher current conditions, was also successfully proven when the VideoRay ROV held depth and position in 0.5m/s current with Longitudinal position accuracy of +/- 10cm and depth held accuracy of +/- 10cm (see computer screen images).



Point and click position, heading, and depth control via the SeeByteCoPilot software – know where you are and where you’ve been at all times (Image Credit: SeeByte)

Automated ROV Control



SeeByteCoPilot Software interface displaying VideoRay ROV station keeping data – in this case, the ROV held position in 0.5m/s current with Longitudinal position accuracy of +/- 10cm and Depth held accuracy of +/- 10cm (Image Credit: SeeByte)

The results were astounding. “The first attempt worked. We were pleased – and exceptionally motivated by this,” said Alastair Cormack of SeeByte, who led the initial SeeTrack CoPilot migration. “This success is partially due to the fantastic software development kit and support by VideoRay – we’re very excited about moving much of our software suite to the VideoRay platform.”

Andy Goldstein, VideoRay’s software manager and the chief architect of VideoRay Cockpit, was impressed by SeeByte’s progress as well as the quality of the software they ported in a short time. “I’ve been following their work for a few years now” he said. “My goal is to work with them until everything relevant within the SeeTrack family is available to VideoRay users. Their solutions have a great deal of relevance to a wide range of users – military, offshore, first responders – anyone who can use help with automated piloting of their VideoRay.”

VideoRay’s annual VIPS ROV conference in Key Largo last month provided an excellent opportunity for SeeByte to demonstrate their early test software to a large group of VideoRay executives, employees, users, dealers, and hardware vendors. This group – consisting of over 150 underwater professionals — were able to use the test SeeTrack CoPilot software in a real-world port environment at the conference. In addition, a wide range of users – first responders, offshore contractors, inshore contractors, port security professionals, and others discussed their needs with SeeByte and VideoRay executives.

A spectator of the demonstration and attendee at the event, Dave Phillips, Undersheriff of St. Louis County Minnesota commented, “I was truly impressed by the ability to plan a survey and have the ROV follow it – it was done so easily. This advancement will dramatically shorten searches and increase confidence that areas have been cleared – definitely a valuable tool.”

Bjarte Langeland, CEO of Stinger Technology AS commented, “I’ve been involved in cutting-edge technology with VideoRay in the North Sea Oil and Gas market for two years now. I believe SeeByte software controlling the VideoRay ROV piloting is one of the most important and significant developments I have seen to date.”

“It has always been my goal to sort of ‘engineer the talent’ out of some aspects of VideoRay control” said Scott Bentley, president and founder of VideoRay LLC. “There is a computer controlling the thrusters, cameras, lights, and instruments and sensors on a VideoRay. But we still require the user to

The VideoRay Pro 4 (right) completes an automated turn, re-routed from its planned mission through a mouse point and click via the SeeByteCoPilot software (Photo Credit: SeeByte)



control each of these with manual joystick input, with the exception of auto-direction and auto-depth. This requires us to have each user practice how to swim the vehicle to a target or along a course, and that takes time, requires skill, and, of course, users can get a bit rusty if they don’t do it regularly. In addition, repetitive tasks like flying to each of a long list of possible targets to identify or ground truth them or following a pipeline, can be very tiring. SeeTrack CoPilot is like cruise control in a car – but far more extensive and exciting. We can’t make each user an expert overnight, but we can help new users accomplish tasks far faster and more effectively.”

SeeByte’s experience on other much larger ROVs with their SeeTrack CoPilot software bears this out.

Following the meeting, Bob Black, SeeByte CEO, showed great enthusiasm regarding the potential to improve the capabilities and user experience in the microROV world. “I can see many, many areas where we will introduce VideoRay versions of software we’ve already engineered in other environments. When working underwater, the quality and accuracy of the mission, inspection, or survey are often dependent upon many external factors, such as the experience and ability of the operator, the quality of hardware, and the capacity to interpret and present multiple layers of data.”



The VideoRay Pro 4 ROV breaks the surface (Photo Credit: Henning Klepp Christensen)

“Our advanced smart software systems provide a higher level of awareness, autonomy, and control that is less operator dependent and is centered upon transforming data into actionable information for imminent decision-making and planning. SeeByte’s SeeTrack Military software is the de facto tool for mission planning and mine countermeasures for 12 of the world’s Navies, while SeeTrack CoPilot and SeeTrack AutoTracker have seen the company partner with leading oil and gas corporations. Much of this is applicable to VideoRay missions.”

VideoRay and SeeByte are actively soliciting beta test users for the new software packages under development. They expect to have prototypes available very soon, and commercial packages available in Q2 2012. Contact info@videoray.com or sales@seebyte.com for more information.