

AUTONOMOUS UNDERWATER VEHICLE



AUV CAPABILITIES

C & C Technologies, Inc., pioneered the world's first commercially operated deepwater Autonomous Underwater Vehicle (AUV) for oil & gas exploration.

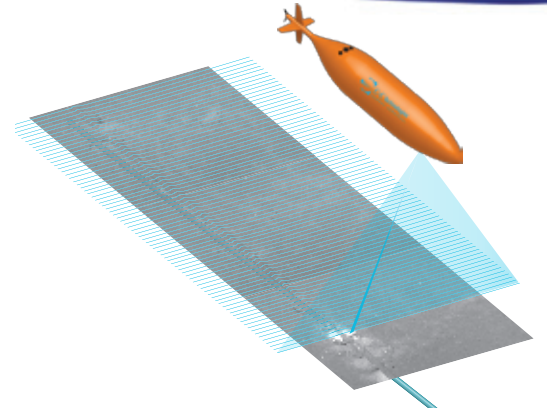
Now the company leads the market with its four AUVs, including the first complete pipeline inspection AUV to incorporate a state-of-the-art Laser Micro Bathymetry System.

As the frontrunner in the fields of AUV technology and deepwater mapping, C & C professionals have an unmatched depth of talent and experience.

C & C sets the standard in deepwater AUV capability with more than 300,000 kilometers of survey for 65 clients, on 376 different deepwater projects.

ENHANCEMENTS

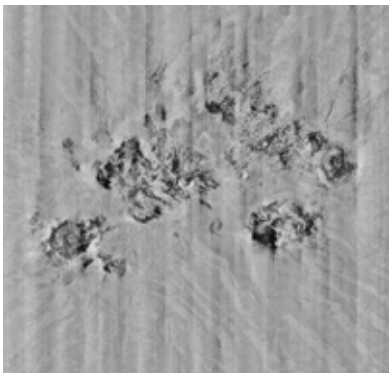
C & C is committed to delivering state-of-the-art data to our clients. Proprietary enhancements to our AUV fleet include a dynamically focused 230 kHz side-scan sonar with a smaller beam width and a higher cross-track resolution versus a standard 120 kHz system, a sub-bottom profiler using a frequency range of 1-6 kHz for deeper penetration with four transmit transducers and a 6 or 8-element receiver array. The C-Surveyor™ proprietary camera system takes flash illuminated black and white photographs of the seabed. The camera takes images at fixed intervals and each photograph has a resolution of 1360 by 1024 pixels with 30% overlap to support high-resolution Seafloor mosaics.



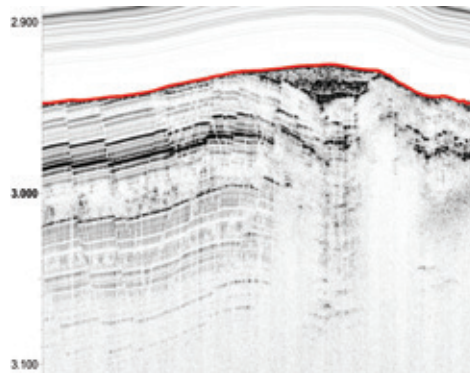
INTRODUCING C-Surveyor VI THE FIRST COMPLETE PIPELINE INSPECTION AUV

Combining C & C's proprietary camera system, laser, upgraded multi-beam, geo-chemical suite of sensors, and "Auto Pipeline Tracking" C & C can provide pipeline inspection with one pass over the top of the pipe or one pass on either side for full inspection and spanning analysis. The 4500m rated Laser Micro Bathymetry System provides high detail span measurements, while the Kongsberg EM 2040 multibeam supports seep/leak detection with water column data.

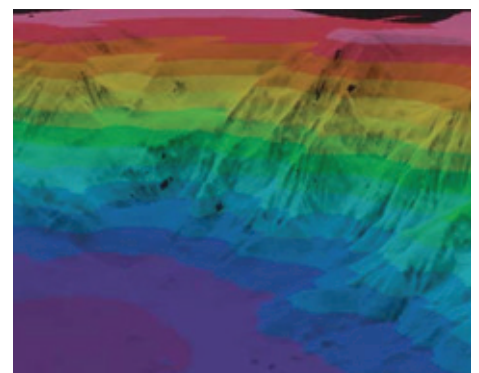
The high-resolution digital camera provides geo-referenced photo mosaics, pseudo-video of pipeline routing, and subsea infrastructure mosaics with 5mm resolution at 8m altitude. Utilizing these technologies, the C-Surveyor VI is capable of running all sensors at a survey speed of 3-4 kts for up to 48 hours, with a selectable survey altitude of 4-8m ensuring optimum efficiency and coverage.



Side Scan Sonar Mosaic



Subbottom Profiler Data Example



3D Bathymetry Data Example
(Data courtesy of BP)

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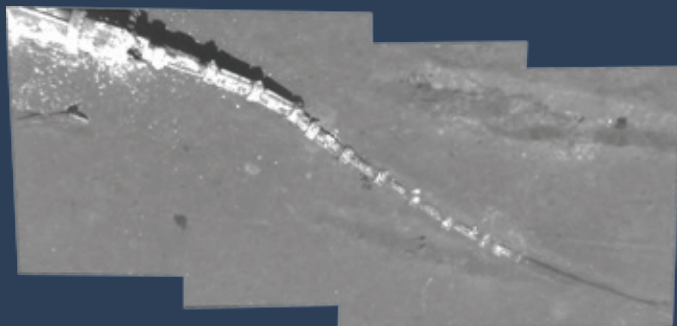
AUV SPECIFICATIONS

C-SURVEYOR III™

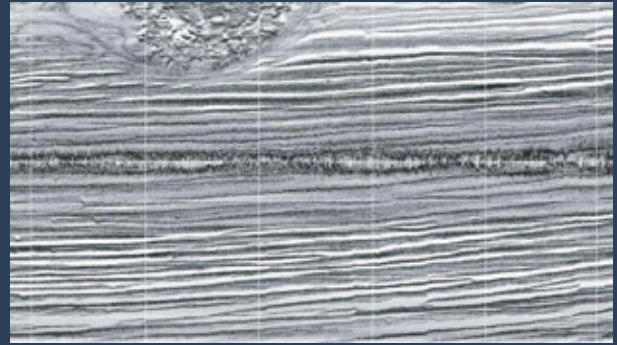
Depth Rating: 4,500 meters (14,763 feet)
Length: 6.4 meters
Power: Aluminum Oxygen Fuel Cell
Multibeam: Kongsberg Simrad EM 2000 - 111 beams
Side Scan Sonar: EdgeTech Full Spectrum Side Scan Sonar: Chirp Dynamically Focused (230 kHz) or Standard 410 kHz (Resolution: ~.7m out to 225m for DF)
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1-6 kHz with 8-element receiver array
High Resolution Camera System with Photo Mosaic Capability at 6-10m from seafloor
Seabird Electronics SBE 49 FastCAT CTD with Digiquartz Depth Sensor
IMU90 Motion Reference Unit
C & C Proprietary Payload Solution
RDI Navigator DVL - WHN300 - 300 kHz
Kongsberg Simrad HiPAP Ultra Short Baseline (USBL) Acoustic Positioning System
Link Quest Acoustic Data Modem for real time data display

C-SURVEYOR IV™

Hugin 1000 AUV
Length: 4.57 meters (15 feet)
Power: Lithium Rechargeable Batteries
Two Interchangeable Payload Packages:
Payload Package A: Edgetech 2200 Side Scan Sonar / Subbottom Profiler with Kongsberg EM 2000 multibeam. Depth rated to 3,000 meters (9,842 feet)
Payload Package B: Kongsberg HISAS Synthetic Aperture Sonar with Kongsberg EM 3002 Multibeam. Depth Rated to 1,000 meter (3,281 feet)
RDI Navigator DVL - WHN300 - 300 kHz
Kongsberg Simrad HiPAP Ultra Short Base Line (USBL) Acoustic Positioning System
Link Quest Acoustic Data Modem for real time data display



C-Surveyor Proprietary Camera Photo Mosaic



*Post Processed Side Scan Data Example
(Data Courtesy of BP)*

C-SURVEYOR V™

Depth Rating: 3,000 meters (9,842 feet)
Length: 6.4 meters (20.99 feet)
Multibeam: Kongsberg Simrad EM 2000 - 111 beams
Side Scan Sonar: EdgeTech Full Spectrum Chirp Side Scan Sonar - 120/140 kHz
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1-6 kHz with 8-element receiver array
High Resolution Camera System with Photo Mosaic Capability at 6-10 meters from seafloor
Seabird Electronics SBE 49 FastCAT CTD with Digiquartz Depth Sensor
IMU90 Motion Reference Unit
C & C Proprietary Payload Solution
RDI Navigator DVL - WHN300 - 300 kHz
Kongsberg Simrad HiPAP Ultra Short Baseline (USBL) Acoustic Positioning System
Link Quest Acoustic Data Modem for real time data display

C-SURVEYOR VI™

Depth Rating: 3,000 meters (9,842 feet)
Length: 6.2 meters (20.34 feet)
Power: Aluminum Oxygen Fuel Cell or Lithium
Multibeam: Kongsberg Simrad EM 2040
Side Scan Sonar: EdgeTech Full Spectrum Chirp Side Scan Sonar - 120/410 kHz
Subbottom Profiler: EdgeTech Full Spectrum Chirp Subbottom Profiler - 1-6 kHz with 6-element receiver array
High Resolution Camera System with Photo Mosaic Capability at 6-10 meters from seafloor
Seabird Electronic SBE 49 FastCAT CTD with Digiquartz Depth Sensor
IMU90 Motion Reference Unit
C & C Proprietary Payload Solution
RDI Navigator DVL - WHN300 - 300 kHz
Kongsberg simrad HiPAP Ultra Short Baseline (USBL) Acoustic Positioning System
Link Quest Acoustic Data Modem for real time data display

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**Specifications subject to change without notice
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