



Steel MacTM
LIMITED

SteelMac Limited, Unit 27 New Harbours, Gibraltar

**AC-CESS ROV & Yellowfin Sonar
with Sea-Sar Controller.**
Specification sheet



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AC-ROV Underwater Inspection System

The world leading micro ROV, the **AC-ROV** is the most capable and portable underwater inspection system on the market. A complete system comes in one rugged waterproof hand carry case with an all up weight of just 18kg. It defines the **"HAND CARRY"** class in underwater inspection systems. **CE Marked** and certified for all "feet wet" applications, offshore, inshore or onshore, it is the safest and quickest tool for your underwater inspection. One person can easily deploy the system in less than **3 minutes**. Not only can it be carried in one hand, it can also be controlled with one hand, leaving the other free to tend to the tether, take notes, operate the manipulator or answer your mobile. The **AC-ROV** is a single operator system and a new benchmark in ROV design.

- Hand Carry
- Rapid Deployment
- Single Operator

The mobility of the AC-ROV sets it in a class apart. The 4 horizontal thrusters operate together to power the AC-ROV forward, back and sideways. Their "vectored" arrangement is like having 4 forward and 4 side, or lateral thrusters. This is the thruster set up on the vast majority of larger commercial ROVs because lateral power and speed is as important as forward power and speed. One is used to get you to the target, and the other is for keeping you face onto the target. More often than not any current at a target will not be head-on, but **SIDE-ON**, so serious inspection requires serious lateral flight capability. This is why the AC-ROV can fly as fast sideways as it can forward and back, or more importantly, **turn and hold station in a current without getting washed away**. There are also 2 vertical thrusters for up, down and tilt control.

- Unequalled Mobility (5 degrees of freedom)
- Equal Forward and Lateral Thrust For Equal Speed in all Directions

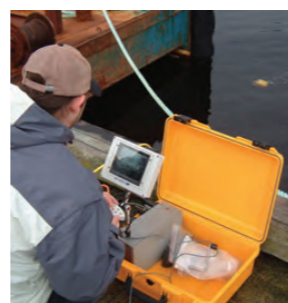
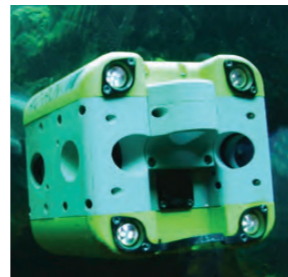
To make the most of the AC-ROV's manoeuvrability, the system uses a truly **intuitive 3D controller** with a single handed grip that can be moved in any direction, rotated and tilted. The AC-ROV responds by moving in the same direction that the grip is moved. The controller also incorporates an array of push button **flight assist functions**.

- 100% Intuitive 3D Control (use any hand)
- Powerful Flight Assist Functions

With a pipe "fly through" size of 190mm and a pipe "drop through" size of 210mm, the AC-ROV can get into seriously small spaces. The unique AC-ROV thrusters do not have central shafts and the inward pointing blades do not meet. They have been proven to be foul proof and provide full bore equal thrust in both directions. This is not the case for shaft mounted thrusters which normally have a motor right in the middle of the flow path and a shaft just waiting to foul up. The design results in an overall power to weight ratio 50 -100% greater than other small ROVs. All these market leading attributes are delivered in an extremely robust, reliable, modular design. Its inherent strength and serviceability means that the AC-ROV keeps coming back for more.

- 190mm Pipe Fly Through
- High Performance Centre-less Thrusters (very efficient and foul proof)
- Robust and Serviceable Modular Design

Check its **PEDIGREE** - designed and manufactured in Aberdeen, (Scotland) by born and bred diving and ROV engineers who routinely deliver solutions for water depths from 0 to more than 6000m. Check these people out at www.alloceans.co.uk



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SPECIFICATION

AC-ROV	MODEL SP50
SIZE	203mm x 152mm x 146mm (8" x 6" x 5.75")
WEIGHT	3kg (6.6lbs)
DEPTH RATING	75m (246 feet)
CAMERA	Colour CCD 550 line x 0.1 lux (NTSC or PAL)
THRUSTERS	6 thrusters (4 horizontal vectored, 2 x vertical)
LIGHTS	4 cluster camera tracking LED's (variable intensity)
CONTROL	5 axis single handed 3-D controller (LH or RH)
MONITOR	145mm (5.7") colour LCD waterproof with angle poise mount
VIDEO OVERLAY	Date, Time, Power Setting, Depth
SENSORS	Depth, temperature, humidity and water ingress
TETHER	Options to 120m with Tether Deployment System (TDS)
TETHER CONNECTION	Back as standard, with Top and Bottom options
SYSTEM POWER	300 watt (0.4hp)
PAYLOAD	200g (8oz)
INPUTS	90/260vac x 47/63Hz auto ranging
OUTPUTS	Composite Video
HANDLING	18kg (40lbs) complete in one hand carry case 490mm x 380mm x 230mm (19.25" x 15" x 9")
INTEGRATED OPTIONS	Rear View B&W Camera (480 line x 0.05 lux) Slip ring Tether Deployment Systems 2 Function Manipulator - Grip and continuous rotate, 2 or 3 jaw grips USBL Positioning and Tracking System Wall Thickness Sensor CP Probe Laser Scaling (variable intensity) Tethers to 52m (hand carry case) Tethers to 120m (roller case)
OTHER OPTIONS	Custom Tether Deployment Systems Alternative or additional monitors Custom Packaging

**190mm Pipe
Fly Through**

NOTES

1. All ROVs suffer from tether drag. It affects flight control and the ability to reach a target and is more noticeable with smaller ROVs. Simple dive planning can help this to work for you. Sometimes fixing a weight a distance behind the ROV to take some of the strain works well. More sophisticated still are Tether Management Systems.
2. Touch buttons on the 3-D controller provide powerful "Flight Assist" functions. These are; Flight Freeze / Flight Un-freeze / Progressive Forward Flight, vertical Trim and Tilt / 3 stage Power Increment / Camera switching.
3. The tether cable and connectors are completely field serviceable. Any damaged cable can be cut out and any remaining serviceable cable reterminated and used again. No need for cable moulding services.
4. Connect any type of video recording device to the system for recording and data logging. A computer is not required and is only used in sales literature for scaling purposes.



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AC-ROV Positioning and Tracking

The market leading **AC-ROV** Underwater Inspection System is now available with an Ultra Short Base Line (USBL) underwater positioning and tracking system.

During ROV operations, there are many situations where you need to know the location of the vehicle with reference to you as the operator, or as a global position reference. Underwater positioning and tracking is fundamental to **high level survey and search applications**, allowing you to log where you need to go, where you have been and to enable target returns by you or others.

Inline with the **AC-ROV** ethos of mobility, portability and robustness the solution is an integrated arrangement of the Tritech MicronNav USBL system. The outcome retains the clean, robust and snag free shape of the **AC-ROV**, whilst the topside hardware and interface is 100% Tritech standard.

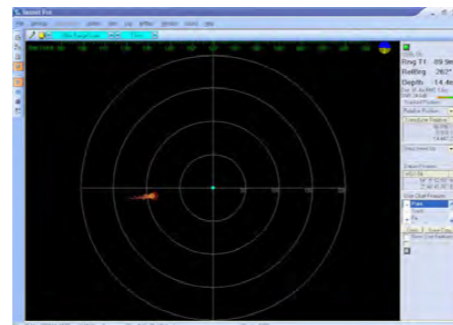
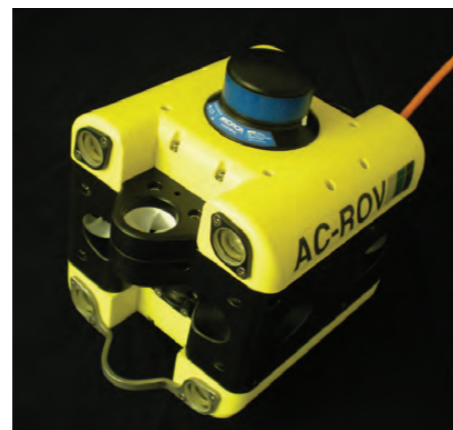
The MicronNav system could not be easier to fit, with **no modifications** required to the **AC-ROV** system and **no specialist training** for integrating the transponder block to the vehicle. The MicronNav system can be configured to input survey and GPS strings giving survey level positioning data with a real world location.

- **Positions and Tracks to Maximum AC-ROV Depth & Excursion**
- **Real Time Global Positioning**
- **AC-ROV mobility, portability and robustness**
- **Simple 'no modification' retrofit**

The MicronNav USBL system calculates **vehicle position** by combining acoustic range and bearing data from the vehicle transponder with attitude and heading data from the surface transceiver. The USBL system comprises a subsea MicronNav unit **fully integrated** into an **AC-ROV** top buoyancy block, a surface USBL transceiver unit with integral magnetic compass and pitch/roll sensors, a surface MicronNav100 Interface module and operating software all under control of the customer host PC/Laptop. The system does not require any additional surface transceivers (SBL) or seabed transponders (LBL).

MicronNav uses the very latest **Spread Spectrum** acoustic technology. This provides robust through water communications between the surface transceiver and the vehicle transponder. The transceiver is designed to provide 180 degree hemispherical coverage, allowing accurate **vehicle tracking in very shallow water**. The design of the ROV transponder provides omni-directional coverage.

- **Spread Spectrum Acoustics for Robust & Reliable Communication in challenging environments**
- **Hemispherical Acoustic Coverage for Shallow Water Operations**
- **Integrated motion sensor in dunking transceiver**



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AC-ROV Thickness Gauge / Laser Scaling

The market leading **AC-ROV** Underwater Inspection System is now available with two further capability options. A Thickness Gauge for measuring metal thickness in locations previously inaccessible to divers, other ROVs and underwater inspection systems, AND a Laser Scaling head for the relative measurement of surface defects, anomalies or any target within its view.

Thickness Gauge

Thickness measurement is an established integrity monitoring technique in industry. Offshore or onshore, the **AC-ROV** can now deploy a thickness sensor in support of your maintenance, safety and survey requirements of any underwater metal. The vehicle mounted probe **reduces inspection time and diver costs**. There is no specialist training requirements resulting in fast, accurate and repeatable results. Measurements can be taken through coatings as there is no need for special surface preparation, coating or corrosion removal. Measurements can also be electronically stored for report generation.

- **Greatly Reduce Inspection Time and Costs**
- **No special surface cleaning or preparation required**
- **Accepted by major Classification Societies**

Inline with the **AC-ROV** ethos of mobility, portability and robustness the solution is an integrated arrangement of the Cygnus multiple echo diver and ROV deployable thickness sensor. The outcome retains the clean, robust and snag free shape of the **AC-ROV**, whilst the top side hardware and interface is 100% Cygnus standard.

The market leading mobility of the **AC-ROV** enables complete "ORBITAL" thickness measurement. A capability never before available by ROV without a manipulator. The first truly comprehensive small ROV thickness inspection capability.

- **Unrivalled Ingress and Inspection Capability**
- **Robust, Serviceable and fully Integrated Design**
- **Unique "ORBITAL" Inspection Capability**

Laser Scaling

The **AC-ROV** Laser Scaling system is a fully integrated twin laser unit that projects two parallel laser beams onto any target giving an **exact indication** of scale. In a market first, the **AC-ROV** Laser Scaling system utilises **variable intensity** lasers so beam strength can be adjusted according to the conditions without compromising video quality.

- **Variable Intensity**
- **Simple 'no modification' Retrofit**
- **Recordable Results**

Another integrated and simple retro-fit **AC-ROV** capability solution combining proven technologies.



SeaSAR - The Complete SAR System

The scene is set. There's been an incident on the water and the resulting evidence has slipped beneath the waves. Search and recovery are called to the scene and immediately deploy a sidescan sonar for a wide area search to determine its possible location. The software on the topside controller records the search track and coverage area and various targets are noted by the operator. While the divers suit up for a closer investigation, a tripod mounted scanning sonar, connected to the same topside controller and operated under the same software, is lowered to the bottom in the vicinity of the previously recorded targets. As with the sidescan, just a single plug connection and the scanning sonar is ready to go. As soon as it is in place on the bottom, the target data recorded in the sidescan software is also indicated on the scanning sonars screen. The divers are ready to be guided to the targets, by the topside operator using the directional information provided by the scanning sonar. Alternatively, the data may be wirelessly uploaded to the divers hand-held sonar and guidance system and used to direct him straight to the target.

weatherproof computer may be removed from it's dock in the controller case and taken in-house for archiving the collected data and report generation. The entire system operates from any readily available 12VDC power source. An optional 120VAC adapter is also available.

While the SeaSAR system may be configured to work with various manufacturers sonars and other detection instruments, certain aspects of it have been designed specifically to communicate with



Shark Marine Technologies' Navigator, diver-held sonar and guidance system. The Navigators Diverlog software accepts target data from the SeaSAR controller and will display the selected target as a "red dot" on the Diverlog compass rose. All that is left for the diver to do, is follow the "red dot" to the target previously located by the sidescan or scanning sonar. The Navigator's multibeam sonar will aid the diver in locating a distant target as well as in identification of it

in poor visibility. If the diver is tethered to the topside controller, the operator will be able to view whatever the diver is seeing on his Navigator display.

The SeaSAR system has been designed to be "Quick and Easy". When time is of the essence, SeaSAR is ready. Open the case, plug it in, turn it on and go! It's graphical display makes switching between sonar screens a one touch operation. Each different sonar connection is clearly marked on the controller and each sonar is connected by a single cable. The built in GPS begins tracking on startup while the layback feature allows for accurate towfish mapping. An optional rechargeable battery pack and numerous other accessories are also available.

For complete details contact us at 519-752-4285 or dindsay@sea-viewdiving.com www.sea-viewdiving.com

The system is called SeaSAR. Originally designed by Shark Marine Technologies Inc., for one of the largest search and recovery agencies in North America, SeaSAR is by far, the most all-encompassing software and topside controller, commercially available. The computer controller, software, power supplies and sonar interfaces are all housed in a single 20" x 17" x 8" rugged case. The sonars each connect through their own individual, waterproof connection on the side of the case and are instantly connected to both the computer controller and power, and ready for operation. During the search, all of the collected data is processed in real-time. This allows for immediate on-site operational decision making and eliminates the need for time consuming post-processing. Upon completion of the operation, the

**IMAGENEX MODEL 872
"YELLOWFIN"
SIDESCAN SONAR**

APPLICATIONS:

- Underwater Archaeology
- Sunken Timber Recovery
- Search & Recovery
- Surveying
- Law Enforcement Work
- Scientific Research
- Environmental Survey

FEATURES:

- Triple frequency
- High resolution 1000 data points per side
- 300 m depth rating
- Up to 400 m (1300') total coverage
- 23 m (75') tow cable included
- LAN compatible
- Built-in track plotter
- Built-in internal GPS receiver
- Record to .XTF in real-time

The Imagenex Model 872 "YellowFin" is a full-featured dual channel, high resolution, sidescan sonar. The YellowFin is an affordable, very user friendly system that incorporates a high speed Ethernet connection to your Windows™ based laptop or desktop PC. Integrated power and a built-in differential-ready GPS receiver complete this fantastic system. Zoom windows are available for target investigation without interrupting real-time data acquisition. Data is displayed in real-time, with or without speed correction, in 9 user selectable colour tables.

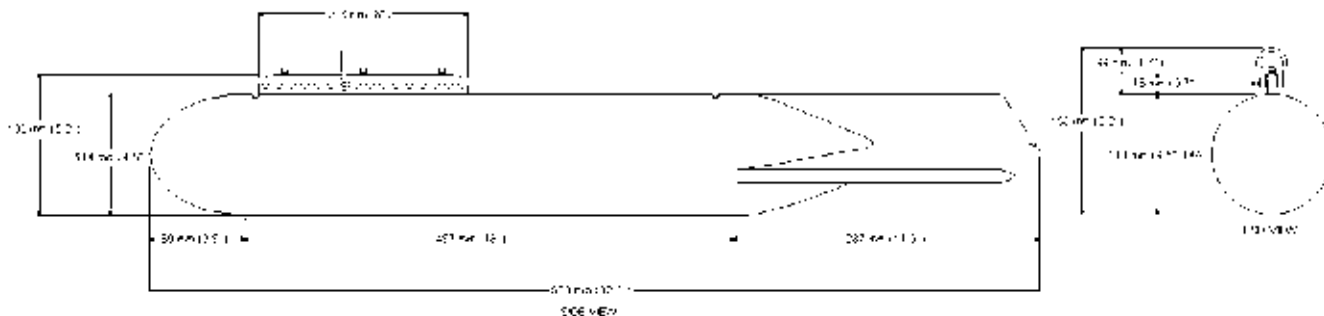


UNDERWATER HARDWARE SPECIFICATIONS:

FREQUENCY	260 kHz / 330 kHz / 770 kHz nominal
TRANSDUCER	One transducer per side, tilted down 20°
TRANSDUCER BEAM WIDTH	260 kHz: 2.2° x 75° 330 kHz: 1.8° x 60° 770 kHz: 0.7° x 30°
RANGE RESOLUTION	Range scale ÷ 1000
MAX. OPERATING DEPTH	300 m (~1000')
MAX. CABLE LENGTH	600 m (~2000')
INTERFACE	Analog telemetry
CONNECTOR	Wet mateable (Impulse MCBH-4-MP)
POWER SUPPLY	40 – 55 VDC at less than 3 Watts, supplied from Surface Interface Box
DIMENSIONS	114 mm (4.5") diameter x 833 mm (32.8") length
WEIGHT:	In Air: 5.4 kg (12 lbs) In Water: 1.8 kg (4 lbs) not including ballast
BALLAST	Standard diver belt weights (readily available at dive shops)
MATERIALS	Polyurethane & 6061-T6 Aluminum
FINISH	Hard anodized

SURFACE INTERFACE BOX HARDWARE SPECIFICATIONS:	
INTERFACE TO PC	10 Mbps Ethernet
INTERFACE TO SONAR HEAD	FSK analog telemetry
CABLE CONNECTOR	5-pin MS (female)
SONAR HEAD POWER SUPPLY OUTPUT	48 VDC
DIFFERENTIAL CAPABLE GPS	Built-in
DIMENSIONS	31 cm (12.2") length x 26 cm (10.2") width x 8.7 cm (3.4") height
WEIGHT	0.9 kg (2 lbs)
MATERIALS	Aluminum
FINISH	Powder Coated
POWER REQUIREMENT	110 / 220 VAC 50 / 60 Hz, 0.1 Amp

SOFTWARE SPECIFICATIONS:	YellowFin.exe
WINDOWS™ OPERATING SYSTEM	Windows™ 98, Me, NT, 2000, XP
ZOOM MODES	1x, 2x, 3x, 4x, and 5x dynamically moveable
RANGE SCALES	10 m, 20 m, 30 m, 40 m, 50 m, 60 m, 80 m, 100 m, 125 m, 150 m, and 200 m
FILE FORMAT	(filename).872, (filename).XTF
GPS INPUT (4800, N, 8, 1) NMEA 0183 FORMATS:	GLL and VTG; GGA and VTG; RMC
RECOMMENDED MINIMUM COMPUTER REQUIREMENTS:	800 MHz Pentium 3 256 MB RAM 2 GB Hard Disk 1024 x 768 x 256 colour graphics



ORDERING INFORMATION:		
300 m unit w / 23 m tow cable	Standard	872-000-150
Surface Interface Box	Standard	872-000-001
60 m (200') Sidescan tow cable	Option	-021
100 m (330') Sidescan tow cable	Option	-033