



SAAB

PETRODIVE
Subsea Robotics Services

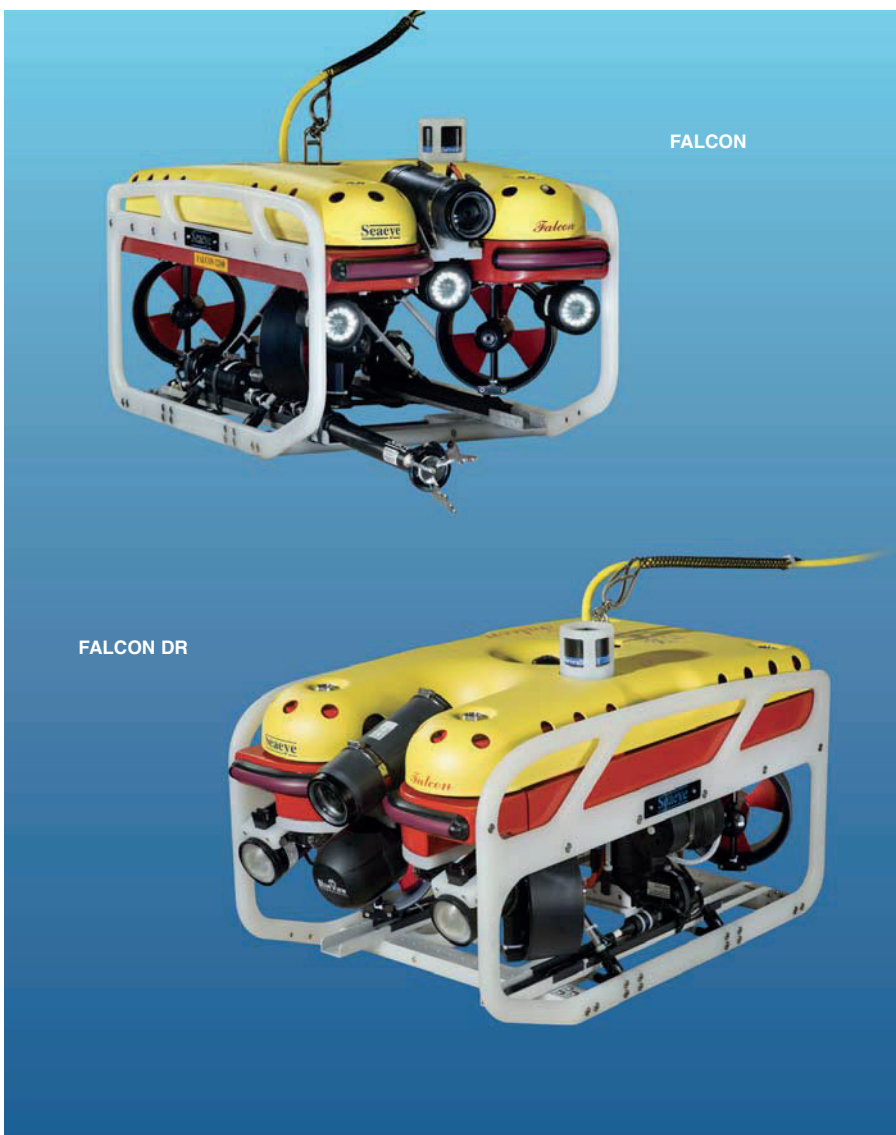
SEAEYE FALCON & FALCON DR



SEAEYE FALCON & FALCON DR

The Seaeeye Falcon and Falcon DR are the choice of many leading operators for capability, versatility and the ability to get the job done. Lightweight and portable they go where they're needed - inshore, offshore, down tunnels or for flyaway operations.

Available with a choice of options, tools and accessories, Seaeeye Falcons make an ideal platform for achieving numerous intricate and demanding subsea applications.



FALCON

FALCON DR

STANDARD FALCON FEATURES INCLUDE:

- 300m (1,000 ft) depth rating, 14 kg (30.8 lbs) payload
- Max 450m umbilical length upgradeable to 1100m length with F2 Fibre Optic Pack upgrade
- Magnetically coupled brushless DC thrusters with velocity feedback - 4 vectored and 1 vertical
- 50 kgf (110 lbs) of thrust with almost 1:1 power to weight ratio, without additional payload
- Distributed intelligence control system
- High resolution colour camera on 180° tilt platform
- Variable intensity, 6400 Lumens of LED lighting
- Auto heading and depth
- Single phase 100-270 VAC universal auto sensing power input at 2.8 kW.

THE FALCON DR OFFERS THE ADDITIONAL CAPABILITY OF:

- 1000m depth rating, 15 kg (33 lbs) payload
- Max cable length 1100m of 14 mm umbilical
- Tilting variable intensity LED lights linked to camera tilt mechanism
- F2 fibre optic data and video transmission system.

THE VEHICLE

CHASSIS LAYOUT

Seaeeye Marine pioneered the use of polypropylene in the construction of ROV frames and continues this development with the Falcon. This material is robust, buoyant, easily drilled and machined and is corrosion free. The Falcon's modern 'open frame' design allows easy access for service and maintenance, and the easy addition of standard bolt on accessories including cameras, sonars, tracking systems and a single function manipulator. Custom designed under-slung modules can also be added for task specific tooling. 316 stainless steel fittings are used throughout.

PROPULSION

Brushless DC thrusters have been used on all Seaeeye ROVs since 1987 when the company first introduced this technology to the offshore oil and gas industry. These thrusters have drive electronics with velocity feedback for precise and rapid thrust control. A fast PID control system and a solid-state rate gyro for enhanced azimuth stability also prevent overshoot on a change of heading making this vehicle so easy to fly.

The Falcon MCT01 thrusters are magnetically coupled and are water cooled. Having no moving shaft seals they are extremely low maintenance, reliable and ideal for use in sensitive areas such as fisheries and on reefs.

Thruster Configuration:
4 Vectored Horizontal Thrusters and
1 Vertical Thruster

The open frame and clutter free layout between decks in the Falcon provides the clearest water flow to 4 horizontal vectored thrusters positioned for optimum thrust and control in all directions and superior station keeping in strong cross currents.

DISTRIBUTED INTELLIGENCE CONTROL SYSTEM & ROV JUNCTION BOX

The Falcon is the first ROV in its class to have a distributed intelligence control system. This is a multi-drop network that allows up to 128 devices to be connected together on a single RS 485 serial network and to be individually controlled by a master processor.

Every controllable device on a Falcon, such as thrusters, lights, camera, tilt motor,

navigation pod and manipulator pod, contains its own microprocessor and interface and is called a 'node'. Each of these 'nodes' is separately addressed on the network and controlled by the master processor in the surface unit. Every node is fully isolated to maximise system reliability and each is connected into the vehicle junction box PCB using a common through bulkhead connector. The JB printed circuit board provides each node with its own fused power supply and telemetry.

The junction box also houses the video line driver for Falcon and the F2 fibre optic multiplexer for the Falcon DR that is an optional upgrade for the standard system.

This use of distributed intelligence does away with the traditional ROV electronics pod packed with interface circuit boards and frees up space while significantly reducing the weight of the vehicle.

BUOYANCY & PAYLOAD

Buoyancy and payload is provided by securing buoyancy blocks of the appropriate depth rating to the chassis below an easily removable hydrodynamic cover. The cover also provides protection to electronics housings and cabling routed along the top of the buoyancy to the junction box. This also provides exceptional ease of access for maintenance.



Mounting points on the vehicle skids are provided for lead ballast to trim the vehicle's centre of gravity and buoyancy.

CONTROL SYSTEM DIAGNOSTICS

Full system diagnostics are provided: A software routine automatically checks each node when the system is powered up and alerts are provided on the video overlay to warn the operator. The full characteristics

of each node can also be interrogated individually from the surface unit. Local diagnostics are also provided for each node in the junction box with colour coded LEDs confirming fuse and telemetry status.

LIGHTING

Two forward facing variable intensity 3200 Lumen LED flood lights are fitted. An optional 3rd light is also available. The lights are powered at low voltage, to improve reliability and longevity. In the Falcon DR the forward facing lights tilt with the camera for improved scene illumination.



CAMERA SYSTEM

A high resolution fixed focus colour camera is fitted to a camera platform that can be tilted ± 90 degrees. An optional second camera can be added. The F2 Fibre Optic Pack in the Falcon DR which is optional in standard Falcons, provides 3 simultaneous video channels. Panning the camera is achieved by turning the vehicle which it can do within its own length.

Standard Camera Specifications

Camera Resolution	480 TVL
Min. Scene Illumination	0.2 LUX (F1.4)
Pick Up Device	1/2" CCD Image Sensor
Lens	1/2" Aspherical 3.8mm lens, wide angle fixed focus
Horizontal Field of View	91°
Tilt	$\pm 90^\circ$

NAVIGATION SYSTEM & AUTO FUNCTIONS

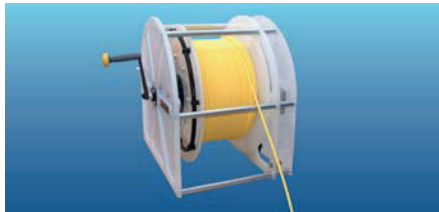
All navigation sensors and aids are housed in a single hardened aluminium pod. Auto depth and heading are supplied as standard. A pitch and roll sensor is included and may be selected for display on the video overlay.

Nav Specifications

Compass Accuracy	$\pm 1^\circ$
Depth Sensor Accuracy	$\pm 0.5\%$ of FSD
Gyro	0.1 %/s
Surface Update Rate	<100 ms

OPTIONS, TOOLS & ACCESSORIES

The Seaeye Falcon's open frame construction allows many standard accessories to be easily fitted. Larger tools and sensor packages can be accommodated using a skid fitted under the vehicle with compensating buoyancy where necessary. A selection of items are featured below however many specialist tooling and custom built accessories are also available.



HAND WINCH



FLIGHT CASE WINCH



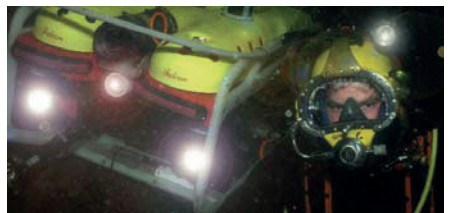
FIBRE OPTIC F2 UPGRADE FOR ADDITIONAL CAPABILITIES



ELECTRIC WINCH



CUSTOM TOOLING SKIDS



3RD LIGHT



CP PROBE



3 JAW MANIPULATOR



5 FUNCTION MANIPULATOR SKID

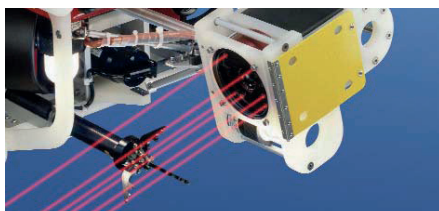
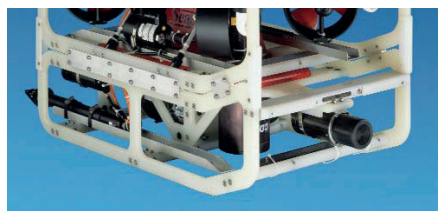


IMAGE SCALING SYSTEM



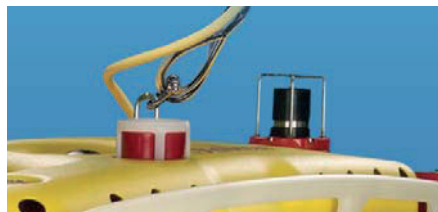
CUSTOM SURVEY SKIDS



LOCK LATCH



SMARTRAK



TRACKING SYSTEM & SONAR OPTIONS



BLUEVIEW SONAR



CLEANING BRUSH



WIRE ROPE CUTTER



DIDSON SONAR

SURFACE EQUIPMENT



INPUT POWER REQUIREMENTS:

Single phase universal auto sensing input, 100-270 VAC at 2.8 kW.

FALCON SURFACE UNIT

The Falcon's switch mode power supplies, control system, fold out 15 inch LCD monitor and keyboard are installed in a 19 inch rack transportable case.

All connections to the surface unit are on the front panel for easy access including the hand controller with its 5 metre flying lead.

The power output from the surface unit to the umbilical is a galvanically isolated 500 VDC protected by a L.I.M. (Line Insulation Monitor).

VEHICLE CONTROLS ON THE HAND CONTROL UNIT

The following vehicle controls are provided on the hand controller:

- Single 3 axis joystick for horizontal vehicle control
- Rotary trim controller for vertical thrust up or down
- Push button dive and surface control
- Thruster enable / disable and power setting

- Camera selection
- Rotary control for lights intensity
- Auto pilot function for both heading and depth
- Auxiliary vehicle controls (including manipulator open / close).

A video overlay system is incorporated as standard providing the following information to the pilot:

- Compass heading
- Depth
- Camera tilt position
- Auto pilot function status
- Umbilical turns counter
- Vehicle pitch and roll
- CP reading
- Date and time
- Lat and Long
- Free text using a QWERTY keyboard.

SEAEYE FALCON & FALCON DR SPECIFICATIONS

SPECIFICATIONS	FALCON	FALCON DR
System power requirements	Single phase 100-270 VAC at 2.8 kW	Single phase 100-270 VAC at 2.8 kW
Maximum umbilical length	450 m	1100 m
Depth rating	300 msw	1000 msw
Length	1000 mm	1055 mm
Height	500 mm	635 mm
Width	600 mm	600 mm
Launch weight	60 kg	100 kg
Forward speed	> 3 knots	> 3 knots
Thrust forward	50 kgf	50 kgf
Thrust lateral	28 kgf	28 kgf
Thrust vertical	13 kgf	13 kgf
Payload	14 kg	15 kg



FALCON DR WITH 5 FUNCTION MANIPULATOR SKID

SAAB SEAEYE LTD

THE WORLD'S LEADING MANUFACTURER OF ELECTRIC ROVS

With over 25 years experience and 700 vehicle systems sold, the company is at the forefront of design, technology, manufacturing process and support for ROVs across the world.

Providing a range of systems from inshore observation level to full deep-sea work class, Saab Seaeeye has pioneered the use of ROVs for many applications, providing customised solutions, developing tools and integrating advanced technologies to achieve results for its customers.

Saab Seaeeye is a wholly owned subsidiary of Saab Group, a major supplier of services and solutions to the global defence sector and celebrating its 75th birthday.

Based in the UK with a worldwide network of experienced representatives, Saab Seaeeye's 24,000 sq ft headquarters in Fareham, includes in house design using the latest computer aided technology, prototyping, workshops, test tanks, pressure testing, motor rooms, machine shop, electronics and PCB sections, vehicle assembly area, stores, training rooms, offices and meeting facilities.

Accredited with DNV ISO 9001, Saab Seaeeye is committed to a safe, clean and efficient working environment, coupled with experienced project management, high quality customer service/offshore support, including 24h emergency contact number and comprehensive stock holding.



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