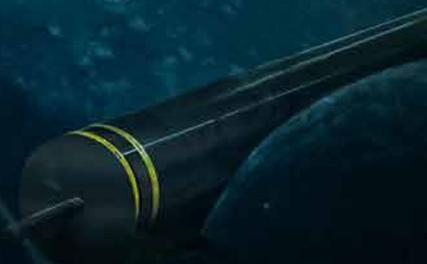


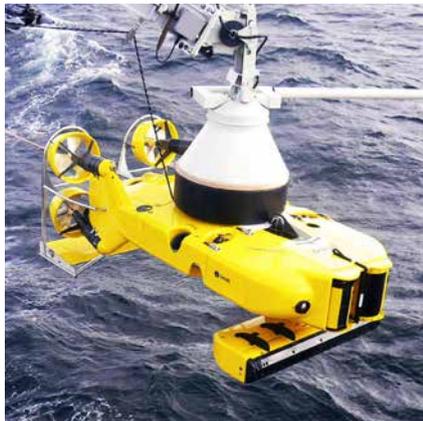


**SAAB**

**DOUBLE EAGLE  
MKII/MKIII PVDS**  
MINE RECONNAISSANCE  
VEHICLE



# COST-EFFECTIVE RECONNAISSANCE



# KNOW YOUR TERRITORY

Underwater mine reconnaissance operations can be dangerous to both vessels and crews. As a global leader in maritime technology, Saab provides safe, reliable solutions that detect mines by travelling ahead to identify threats. These systems are highly robust and can be used in even the harshest environments.

Saab's Double Eagle MkII/MkIII Propelled Variable Depth Sonar (Double Eagle PVDS) provides a perfect example of Saab's **thinking edge** in action.

The remotely operated system offers a cost-effective approach to mine hunting that protects against the threat of maritime explosives and improves crew safety.

The top mine countermeasures (MCM) choice for many navies around the world, the system is equipped with a rotatable, forward looking sonar which increases its detection range and enhances situational awareness – helping forces stay ahead.

With unlimited endurance, the Double Eagle PVDS offers increased stand-off, as well as a high degree of protection against the threat of mines.

The system can be packed into a standard container meaning it can be easily lifted from ship to ship, or be transported by road or air. This efficient stowage capability means that the Double Eagle PVDS can quickly go where it is needed for optimized MCM operations.

When ready to use, the system can be launched from any type of ship, from the shore, or from a craft of opportunity (COOP).

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## OPERATIONAL CONCEPT

Traditionally, mine reconnaissance was performed by an MCM ship with a hull-mounted or towed sonar, which consumes both time and resources. The Double Eagle PVDS takes a new approach, and runs several hundred metres ahead of a ship, using sonar to detect any underwater mines. The mine hunting sonar is carried in the bow of the vehicle so that it can conduct routine survey tasks, including underwater search, object detection and classification.

This new concept not only improves ship and crew safety, but also enhances the performance of the sonar, as it is possible to vary both its depth and the viewing angle of the target.

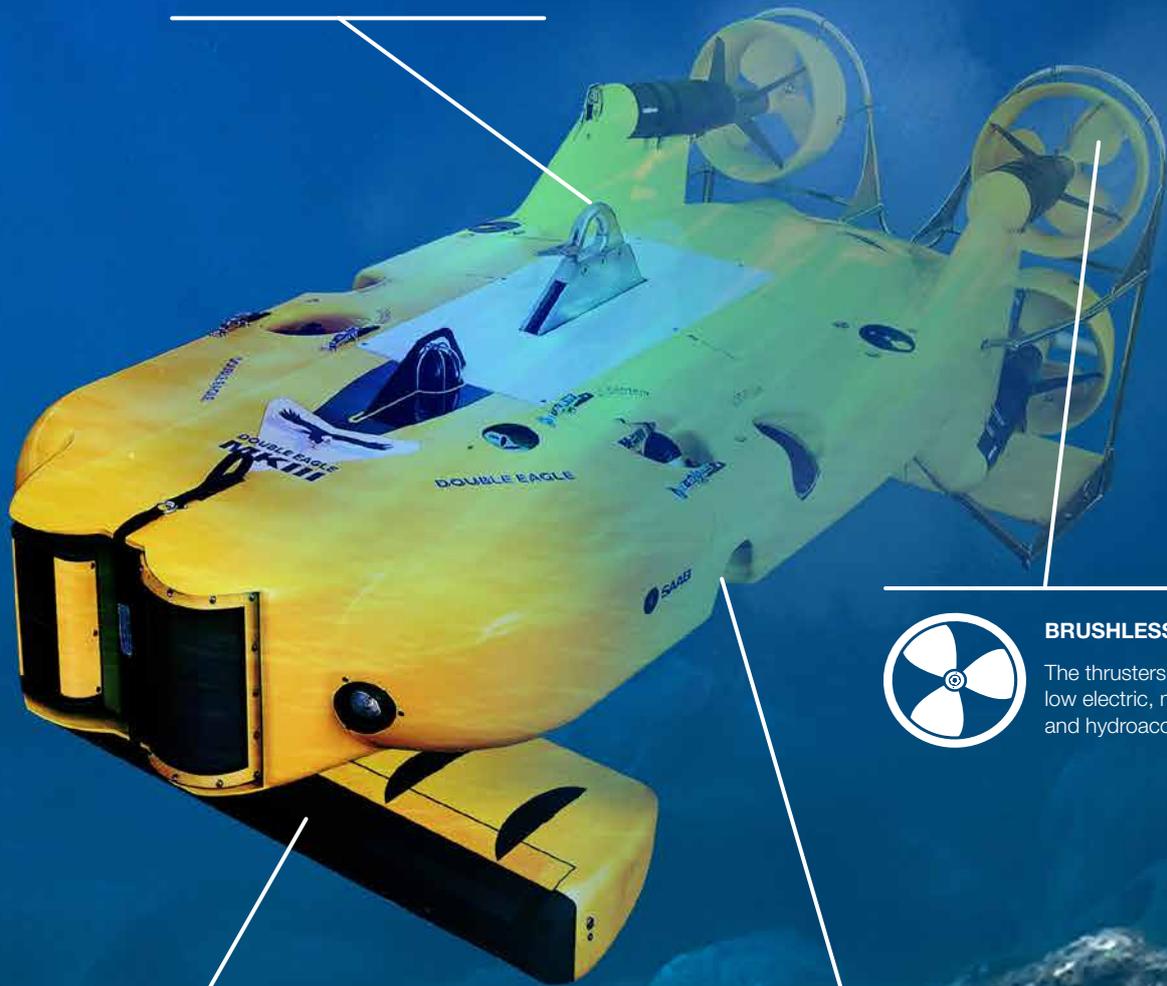
During a mission, the Double Eagle PVDS is launched from a ship and the operator merges it with a track defined from the ship's tactical system. The track consists of waypoints that the vehicle navigates between one at a time until it reaches the end.

The operator can change the track of the vehicle at any time by sending new waypoints, or they can manually control it and pilot the vehicle to investigate an object of interest. This capability allows for earlier detection of Mine-Like Objects (MLOs) and prevents ships from accidentally sailing over a suspicious item. The use of the track also means that the Double Eagle PVDS can operate under different layers in the water, e.g. changing salinity and temperature. This enables it to perform multiple types of MCM mission, even in adverse conditions and strong currents.



**LIFTING BEAM**

The steel beam connects with the winch and onboard crane for easy, secure launch and recovery



**BRUSHLESS MOTORS**

The thrusters emit very low electric, magnetic and hydroacoustic noise



**FORWARD LOOKING SONAR**

Rotatable and tiltable multi-frequency sonar enables high performance detection and classification of MLOs in the most difficult environments



**NAVIGATION**

USBL, MEMS, DVL and speed log for navigation

# ONE STEP AHEAD

## SYSTEM OVERVIEW

The robust Double Eagle PVDS has a modular design, offering high levels of flexibility and short turnaround times for MCM operations. The hydro-dynamically stable, highly reliable system boasts exceptional performance and low lifecycle costs, making it an ideal, cost effective choice for operators.

The Double Eagle PVDS comes with all the controls required to manoeuvre the vehicle, including an Operator Control Board (OCB), a Portable Operator Control Board (POCB) and software that is ready to run on any general purpose or dedicated vehicle console. The heart of the control system is the Surface Control Unit (SCU) which runs the autopilot and interfaces with all other ship systems.

The vehicle is connected to the ship via a tether. As well as providing vehicle power and control signals, the tether continuously sends real-time sonar data to the operator on board the ship.

The Automatic Tension Control Forced Cooling (ATC-FC) winch and the tether, together with the Tether Protection System (TPS) and the TPS launcher, allow the system to be operated without risk of the tether entangling with other underwater ship systems. These features also provide additional stability to the vehicle when decoupling the ship's movements from the vehicle. The cooling of the tether is a prerequisite for high performance operation over long periods.

The Double Eagle PVDS has a Power Converter Unit (PCU) which converts the ship's power to vehicle power. The PCU also includes insulation monitoring with a circuit breaker for added safety.

The system features a cradle or trolley for vehicle stowage and a Launch and Recovery System (LARS) for the vehicle. These tools are used in conjunction with a sea crane on board the ship, enabling safe, easy launch and recovery of the vehicle.

SYSTEM SPECIFICATIONS	DOUBLE EAGLE MKII PVDS	DOUBLE EAGLE MKIII PVDS
LENGTH	2.2 m	3 m
WIDTH	1.3 m	1.2 m
HEIGHT	0.5 m	1.3 m
WEIGHT IN AIR	360 kg	500 kg
WEIGHT IN WATER	Adjustable, slightly buoyant	Adjustable, slightly buoyant
SPEED	0-6 knots	0-7 knots
OPERATIONAL DEPTH	500 m	500 m
PAYLOAD	250 kg	250 kg
VEHICLE CONTROL	6 Degrees of Freedom, auto depth, auto heading, auto altitude, waypoint steering and autopilot	6 Degrees of Freedom, auto depth, auto heading, auto altitude, waypoint steering and autopilot
NAVIGATION SENSORS	Ultra Short Base Line (USBL), Microelectromechanical Systems (MEMS), Doppler Velocity Log (DVL) and speed log Optional: Inertial Navigation System (INS) and GPS	Ultra Short Base Line (USBL), Microelectromechanical Systems (MEMS), Doppler Velocity Log (DVL) and speed log Optional: Inertial Navigation System (INS) and GPS
CAMERA	Colour camera Other types of camera available on request	Colour camera Other types of camera available on request
TETHER	1,000 m, 11 mm power and fibre optic	1,000 m, 15 mm power and fibre optic
POWER SUPPLY	Via the tether	Via the tether
ENDURANCE	Unlimited	Unlimited
COMMUNICATION	Fibre optic – Gigabit, Ethernet	Fibre optic– Gigabit, Ethernet
SONAR ALTERNATIVES	Advanced forward looking multi-frequency mine hunting sonar	Advanced forward looking multi-frequency mine hunting sonar



**SAAB**

SAAB DEVELOPS **HIGH TECHNOLOGY**  
UNDERWATER SYSTEMS THAT ENABLE  
ARMED FORCES TO ENHANCE THEIR  
**SITUATIONAL AWARENESS**, EXTEND  
THEIR **OPERATIONAL CAPABILITIES**  
AND RESPOND TO **ANY THREAT** – EVEN  
IN THE **HARSHEST ENVIRONMENTS**.

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