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# C-WORKER 4 AUTONOMOUS SURFACE VEHICLE (ASV)

## Inshore and Coastal Survey ASV

VEHICLE CHARACTERISTICS	
Length	4.2m
Beam	1.6m
Height	2.7m (including antennas)
Draught	0.6m (not including payload)
Weight	1,030kg fully fuelled (not including payload)
Construction	Aluminum hull and deck, GRP top sections
Sea state	Operations in up to and including sea state 4 Survivability in up to and including sea state 5
Speed range	6 knots maximum speed 3.5 knots cruising speed
Endurance	Up to 48 hours at cruising speed
Launch and recovery	Single-point lift solution optimised for raised platforms UK road legal trailer for slipway launch
Navigation aids	Halo 20+ radar GNSS compass (primary) Solid-state compass (secondary) Speed/depth/temperature sensor Class B AIS transponder Port and starboard navigation lights, all-round white light Horn
Cameras	360-degree camera box featuring four daylight cameras (forward/aft/port/starboard) and one forward-facing thermal (IR) camera
Propulsion	30hp inboard diesel engine driving a waterjet
Fuel capacity	110 litres (diesel)
Standard vehicle control	Mission planning (lines, waypoints, station keeping, geofencing) Direct remote control via a hand-held control unit
Optional vehicle control	Autonomous route planning with collision avoidance system
Primary communications link	5W COFDM IP mesh radio Tuneable RF channel bandwidths of 1.25 MHz to 10 MHz ~5km range with remote station antenna height of 3.5m Range can be increased with remote station antenna height >3.5m
Alternate communications	4G LTE cellular data connection Wi-Fi
Electrical power (DC)	1x 24V DC house battery bank 1x 12V DC engine start battery External shore power connector for shore supply charging
Electrical power (AC)	230V AC via a 1,000W 50Hz inverter/charger
Payload capacity	~40kg wetside payload capacity (MBES, ADCP, SBP, CTD etc.) Payload sensors mounted on an Underwater Retractable Mast (URM) Payload control equipment is located on-board in a 10U 19" rack unit, housed in a watertight compartment



C-Worker 4 is a robust and capable Autonomous Surface Vehicle ideally suited to inshore and coastal survey work.

With a small draught and a waterjet propulsion system, C-Worker 4 can operate in shallow and constrained waters often inaccessible to standard survey vessels.

The vehicle has a sea chest containing a remotely actuated ram used for mounting and lowering subsea sensors below the waterline.

A 10U 19-inch rack unit is fitted inside a watertight forward compartment for the housing of sensor control equipment.

C-Worker 4 is a rugged and proven platform with several vehicles having been deployed in a variety of operations all over the world. The vehicle can be fitted with a wide range of sensors and is ideally suited to applications such as hydrographic survey, port and harbour surveillance, and environmental monitoring.

C-Worker 4 is quick and easy to mobilise via a single point lift system, enabling the vehicle to be launched and recovered from a support ship or dockside. Alternatively, C-Worker 4 is supplied as standard with a road trailer enabling deployment via a slipway.

C-Worker 4 is operated using the ASView control system, which enables pre-programmed missions to be set up, executed and monitored via a graphical user interface. Control modes include waypoint and line following, heading and track hold, station keeping and geofencing. The vehicle can also be operated using a bespoke hand-held remote control unit.

ASView features standard S57 navigational charts with the ability to import files such as geotiff and .dxf survey lines. Situational awareness is provided by a 360-degree camera box on the vehicle's mast featuring four daylight cameras and one forward-facing thermal (IR) camera. Live video feeds are transmitted to the remote station in real time.

C-Worker 4's operational safety is enhanced by a SIL1-assured emergency stop system, and a supervision timeout feature that enables the vehicle to perform pre-programmed actions/missions following a loss of communications.

The vehicle's remote station control equipment is hand-portable and has a small form-factor enabling quick and easy set up to provide a control centre shore-side or on-board a support vessel.

Optional additions to the standard C-Worker 4 package include a remotely deployable winch, a COLREG-aware route-planning collision avoidance system, and the provision of tailored operator and maintainer training programmes. L3Harris can also provide bespoke solutions for ongoing technical support and vehicle maintenance.



#### PACKAGE INCLUDES

- C-Worker 4 with 5W COFDM IP mesh radio, 4G LTE and Wi-Fi communications links
- Trailer
- Hand-portable remote station equipment including ASView-Base station, ASView-Helm remote control unit, ASView-Bridge laptop with User Interface, antennas and associated cables

#### OPTIONAL ADDITIONS

- Advanced autonomy with path-planning collision avoidance system
- Payload winch to 100m depth with a 5kg payload (e.g. sound velocity profiler)
- Tailored operator and maintainer training courses

#### C-Worker 4 Specifications

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