



Image for illustrative purposes only - UAV with ARC™ Primary Radar cooperating with ARC™ Secondary radars on the HMS Duncan (D37) - Type 45 air defence destroyer

Accurate localisation and resilient landing capabilities are vital to Uncrewed Aerial Vehicles (UAVs) successfully completing their missions and ultimately securing Beyond Visual Line of Sight (BVLOS) operational certification. Most UAV operations depend on favourable weather and lighting conditions, and largely rely on Global Navigation Satellite Systems (GNSS). Challenges arise, however, when weather deteriorates, visibility is reduced or GNSS signals are temporarily unavailable or actively blocked.

ARC™ Overview

Sensoriis' patented radar technology Active Radars Cooperating (ARC™) provides precise landing and loitering capabilities using direct radar range measurements regardless of the conditions. Each ARC™ device is configured with a unique code, allowing secondary devices to be non-transmitting until interrogated by an associated airborne primary device in a recognised encoded band.

Key Features

- Small, lightweight micro-radars specifically designed for battery power on UAVs
- All weather, GNSS-denied, patented communications between multiple radars (airborne primary to ground-based secondaries)
- Radar provides range (to 1cm), elevation, bearing and altitude (c.f. Rangefinder)
- Target information is consumed and enacted by MAVLink compatible flight controllers or via the Sensoriis Application Programming Interface (API)

Key Benefits

- All-weather, day or night operation
- Performs in GNSS-denied environments
- Facilitates autonomous landing and loitering
- 'Default Silent' technology – critical where electronic radio stealth is required
- Tested and proven with partners

Applications

- Autonomous landing of UAV onto a stationary or moving platform
- Loitering of UAV in a fixed position / altitude above a specified target
- Radar-based 'tethering' of a UAV to a moving vehicle or vessel



Highly effective in
All Weather
Conditions



Long-Range,
high-resolution
measurement



Low Powered,
no moving parts

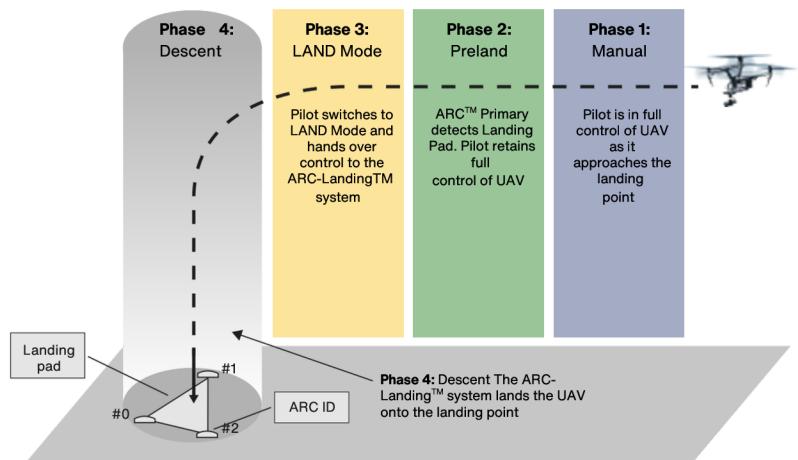


Small and
lightweight
SWaP

ARC-Landing™

ARC-Landing™ is a system that comprises a primary radar mounted on the UAV and three secondary radars installed on the landing pad. The primary device accurately measures the range and direction of the secondary devices and uses this information, (which is transmitted via the MAVLink Precision Landing Target protocol) to provide an accurate landing position to the UAV flight controller, thus facilitating an autonomous landing. The system dynamically compensates for roll, pitch, and yaw movements experienced on a landing pad on a vessel, and, most importantly it provides essential resilience in challenging conditions such as adverse weather, low visibility, and GNSS outages.

ARC-Landing™ autonomous landing sequence using MAVLink LAND mode



ARC-Loiter™

ARC™ can also be used to support loitering, an operational mode where a UAV holds a fixed position and altitude above a specified target. For example, the UAV can loiter directly above, or track and follow a moving vessel or vehicle, referred to as radar-based 'tethering'. This is particularly beneficial for intelligence, surveillance, and reconnaissance (ISR) missions, or search and rescue operations.

ARC-Loiter™ system enables the UAV to autonomously track and follow the moving vehicle i.e. radar-based 'tethering'



Detection Distance	120 metres instrumented, extended range options available
Range accuracy	0.01 m
Angular Field of view Horizontal	up to 120 deg
Angular Field of View Vertical	≈ 90 deg
Number ARCTM radar per Primary	3
Interface	+3.3V TTL UART MAVLink2/Sensoriis API
Physical:	
Dimensions	120 x 120 x 45 mm (on Pad), 78 x 60 x 20 mm (OEM* board on UAV)
Weight	≈ 300g (on Pad) ≈ 30g (on UAV)
Power supply	12Vdc < 5W
Environmental:	
Ingress	IP67
Temperature	-20 to 60 degC

*Approved partners only.

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