

ARV-i

A resident autonomous underwater vehicle (AUV) is the latest offering from underwater vision pioneers Boxfish Research

Products from New Zealand-based company Boxfish Research have provided “eyes underwater” for the marine industry since 2016. The company introduced the world's first spherical underwater camera, and manufactures a range of ROVs capable of transmitting uncompressed ultra-high definition video to the surface from depths of up to 1000m.

Now the company is jumping on the autonomous trend, helped by a partnership with underwater power and communication specialists Transmark Subsea from Norway. Designed for the offshore infrastructure and asset inspection industries, their latest product, ARV-i, is a self-charging, artificially-intelligent observation vehicle that “lives” in the same environment as its underwater subjects.

ARV-i is an entirely new class of autonomous vehicle, providing its customers with a range of operational configurations. As a resident vehicle, ARV-i will spend its time entirely underwater, for up to 12 months per deployment. The vehicle is designed to be autonomous, using prior programming and onboard intelligence to locate and observe underwater assets. When its battery is low, ARV-i will return to its proprietary docking station for wireless battery charging and transfer of data collected from the completed excursion.



A manual piloting mode is also available for ARV-i when human eyes are required for a closer look at certain assets. ARV-i can be remotely controlled from a paired control station anywhere in the world using wireless or fixed IP connections through 4G/Internet tether extension adapters.

The vehicle is designed to operate without a tether connection to the surface, but tethered options are available for customers who require superior video quality – a tethered solution is the best option to access the uncompressed 4K video stream or transmit data from ARV-I at higher rates.

ARV-i and dock



BOXFISH 360

The Boxfish 360 spherical underwater camera encloses three 4K cameras with Micro Four Thirds sensors in a robust aluminium alloy housing, with a single charge port and access point.

The 360's controller precisely syncs each camera with a single start/stop button, making for an efficient recording process. Three

large 5.5in acrylic domes reduce distortion underwater, and with only three seams, footage from the camera can be easily stitched together to create seamless spherical video.

In addition, videographers have full control of camera settings including shutter speed, ISO and white balance.



Boxfish 360

BOXFISH ROV

The main ROV body consists of a cylindrical pressure vessel composed of a hard anodised aluminium alloy. Dimensions vary slightly depending on depth rating, but the 500m-rated ROV is 700mm (28ins) long, 430mm (17in) wide,

Experience in Depth

Supporter 6000 for REV Ocean tested in Kystdesign test pool



stands 350mm (14in) high, and is just 25kg in air. Slightly larger 1000m-rated versions are also available.

The Boxfish ROV has a highly-available, fault-tolerant design, with precise movements in six degrees of freedom enabled by highly sensitive surface controls and a range of piloting modes to best suit the user's experience level. It can operate in a wide range of climates, in temperatures between -10degC and 45degC. Should an unexpected disaster strike, the ROV can operate with several failed thrusters. If communication is lost, the ROV will use its unique return-to-surface feature.

Inside the ROV are three cameras. The main camera captures live uncompressed 4K video which is displayed in real-time on a 17" 4 UHD monitor on the surface console, while navigation cameras and telemetry data are shown on a second, super-bright 10" HD monitor. Video can be recorded on a specialised device (Atomos Ninja V 5" 4K HDMI Recording Monitor) which plugs in directly to the control console.

The cameras are supported by a pair of forward-facing 8500 lumen, high CRI, dimmable lights on adjustable arms and ball mounts to allow lighting in all orientations.



Boxfish ROV

Additional forward lighting options are available, and the ROV also has reverse-pointing lights.

The standard Boxfish ROV also incorporates a variety of sensors, including depth, internal humidity, battery and supply voltages, thruster telemetry, dual IMU, pressure sensors and 3D compass. The modular design of the ROV allows the integration of additional devices such as USBL (underwater navigation), laser scalars, sonar devices (imaging, scanning and profiling), manipulator/grabbers, DVL, CTD, photogrammetry cameras and more.