

Ocean Robotics Planet

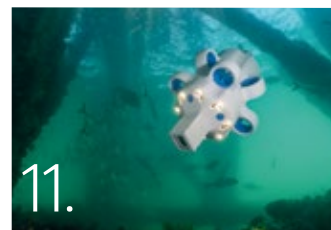
Powered by  PLANET



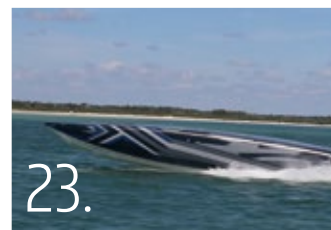
 QYSEA



7.
QYSEA's Small Sized ROVs Advance Marine Operations



11.
Hydrus: A Dawning AUV Drone Revolution



23.
U.S. Marine Corps Explores Using USVs



37.
HUGIN Edge Making a Splash

31

The magazine of choice for Ocean Robotics focused Professionals

ISSUE

Q2 / 2022

**FIFISH PRO W6**700mm (l) x 469mm (w)
x 297mm (h)**FIFISH PRO V6 PLUS**383mm (l) x 331mm (w)
x 158mm (h)

QYSEA TECHNOLOGY REDEFINING OCEAN ROBOTICS

Advancements in underwater robotics and technologies – through increasingly compact, capable, and autonomous systems – have led to a rapid boost in operating efficiencies, data-collecting methods, and working safety across the marine sectors. Since its founding in 2016, QYSEA Technology has become an industry leader in developing advanced compact inspection ROVs. Led by a core of talented and experienced engineers, AI developers, and field specialists, QYSEA leads to drive innovative and sustainable subsea solutions for professionals worldwide.

The FIFISH Underwater Robots – developed by QYSEA – is a series of compact professional ROV solutions designed for advanced small-scale operations and inspections. The FIFISH's self-developed vector thruster system achieves 360-degree freedom in underwater mobility for the operator, redefining industry standards of small robotics implemented for

professional marine inspections, operations, and explorations. QYSEA's latest industry-grade models, the heavy-duty FIFISH PRO W6 (350m depth rated) and smaller-sized FIFISH PRO V6 PLUS (150m depth rated), combine a powerful motor system, tool integration platform, and intelligent adaptive functions that enhance the users' operating experience and capabilities.



FIFISH PRO V6 equipped with the 2D Imaging Sonar & Robotic Arm (Courtesy of QYSEA)



FIFISH PRO V6 PLUS equipped with the 3-Finger Robotic Arm (Courtesy of QYSEA)



Onshore Power Supply System (OPSS) compatible with all FIFISH Underwater Robots (Courtesy of QYSEA)

FIELD-LEADING TECHNOLOGIES & ADVANTAGES

QYSEA's key technological advantages are a result of its fluid and durable build, compact and powerful motor, multi-tool expansive platform, range of smart software algorithms, and advanced imaging system.

The FIFISH ROV's patented hydrodynamic and droplet-shaped design delivers minimal resistance to ocean currents, resulting in reduced power consumption and increased average dive times of up to 5 hours. In addition to its fluid design, the compact yet robust build provides a fully sealed and all-around protection against corrosion and sand particles.

The Q-Motor is a self-developed and double closed-loop induction motor system that achieves autonomous control, strong depth resistance with high stabilization, as well as improved energy efficiency. Rigorously tested to provide

over 800 hours of reliable usage and operation, the six-motor system arrangement utilizes intelligent algorithms to actively adapt to its surroundings, delivering highly stable and smooth mobility for its ROV users. Combined with the ROV's lightweight aluminium propellers, the Q-Motor reaches speeds of up to 4 knots along with essential safety mechanisms to prevent overheating, short-circuits, and overcurrent.

QYSEA's patented Q-IF interface enables integration with a wide range of attachments that are specially developed to meet professional requirements across offshore operations, fish farming tasks, conservation missions, and deep-sea explorations. The integration system is achieved through the FIFISH ROV's accessory port, which unlocks access to over 60 add-on tools for inspections, measurements, object recoveries, quality samplings, navigation, and adaptive positioning. Further patented add-on systems have been developed to benefit FIFISH operators, including a portable power supply that achieves unlimited dive lengths, a live-streaming device for large-screen and multi-team collaborations, remote long-distance control using 5G networks, and much more.

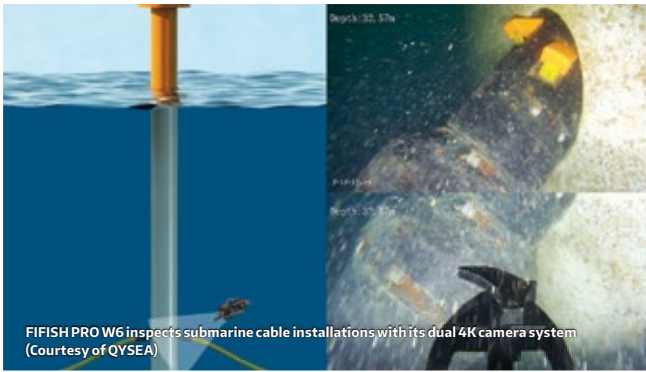
QYSEA applies a comprehensive and adaptive underwater communications system through artificial intelligence and big data analytics. From object collision avoidance to positioning locks, QYSEA's miniaturized and adaptive system aims to modernize underwater operations and intuitively understand the operator's requirements. QYSEA also aims to bring out the best of both worlds with traditional and modern solutions, by combining laser scaling and augmented reality, delivering optimal accuracy for underwater measurements of objects.

Optimized imaging is delivered through QYSEA's robust camera system and smart visual algorithms. Equipped with a single or dual 4K UHD camera at 30 FPS, along with a 166° field-of-view lens and ultra-bright LED lights of up to 12,000 lumens, the details, and colors of surrounding underwater environments are fully captured and realized. QYSEA's low-latency camera system and self-developed AI algorithms deliver vibrant imagery among turbid environments while removing all unwanted distortions, resulting in the most capable camera solution yet among small-sized ROVs.

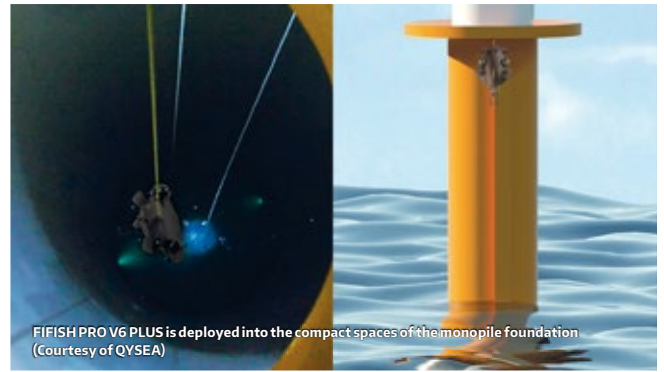
AN ESSENTIAL PARTNER IN SMALL-SCALE MARINE OPERATIONS

The combination of the FIFISH's compact size, rugged build, smart systems, expandable capabilities, and flexible movement provides an optimal solution for professionals operating in the offshore field. With complex and unpredictable hydrological conditions surrounding offshore working platforms, QYSEA's autonomous solution aims to minimize the human risks of traditional scuba diving methods and boost performance in the working field through a seamless operating experience with real-time feedback.

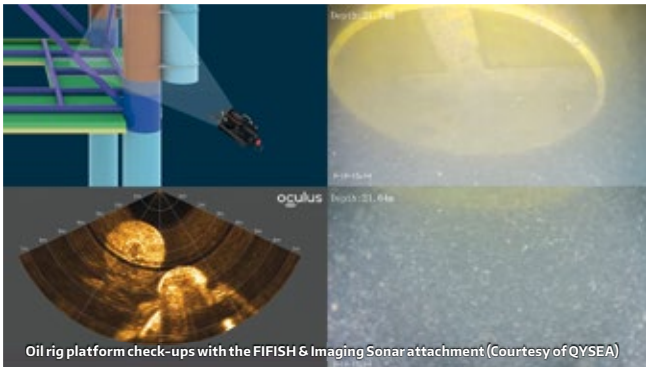
Pile foundations of offshore rigs can be frequently monitored and maintained through a simple and quick deployment of the FIFISH Underwater Robot. Examine the conditions of



FIFISH PRO W6 inspects submarine cable installations with its dual 4K camera system (Courtesy of QYSEA)



FIFISH PRO V6 PLUS is deployed into the compact spaces of the monopile foundation (Courtesy of QYSEA)



Oil rig platform check-ups with the FIFISH & Imaging Sonar attachment (Courtesy of QYSEA)

essential beams, buoys, and boards in dual 4K UHD clarity and at up to 12,000 lumen LED brightness. The FIFISH's all-directional mobility and powerful motor enable movement across strong currents and the ability to reach a depth of 30 meters in under 5 minutes. Users can achieve greater functionalities -essential to their offshore operations- by adding on a myriad of inspection, navigational, and measurement tools. The advanced imaging sonar attachment helps the operator effectively identify short-range and long-range objects in turbid conditions with dual-frequency capability. Utilizing the Station Lock Module attachment, operators gain an adaptive system allowing the FIFISH to remain in its locked position against currents and other underwater interferences with unparalleled accuracy and precision. The rugged and powerful capabilities of QYSEA's small-sized ROVs allow users to take on tasks typically performed with considerably larger vehicles.

As wind energy leads the way for renewable energy resources, offshore wind farms across the world's coastal regions are seeing increased importance, requiring high operating efficiency and frequent maintenance. The installation of essential submarine cable systems -responsible for transmitting power between the turbines and power stations- are as efficient as ever through the operational tandem of the FIFISH PRO W6 and FIFISH PRO V6 PLUS. Installing bend restrictors for the submarine cables requires the larger-sized W6 ROV to operate from the outside, using its powerful motors, adaptive stability system against currents, and a rugged robotic arm to work through currents and bring the tow rope through the entrance slot of the wind turbine's pile foundations. Within the working platform of the wind turbine, operators can release the V6 PLUS ROV down to the compact spaces of the monopile foundation, using its high-precision robotic claw to retrieve the tow rope from the and pull it back

up to the platform. The restrictors and cables can then be inserted and installed through the tow rope, while the FIFISH ROVs continue to monitor the operation -from the inside and outside of the wind turbine- ensuring a smooth, seamless and successful installation.

A GREAT RANGE OF PROFESSIONAL APPLICATIONS

The FIFISH's small-size, robust operating system, and specialized tools provide operators with numerous working advantages across the marine industry, including aquaculture, shipping, underwater security, search and rescue, marine conservation, and much more.

FIFISH delivers a stable solution for fish farmers to monitor and assess their livestock. In addition to reducing operational costs and human risks, operators can utilize specialized tools -such as the Mort Remover tool to remove elements at risk of spreading diseases, or the Net Patch Kit to quickly repair damaged operating areas- to elevate the efficiency of their operations.

QYSEA's patented Underwater Quick Positioning System (U-QPS) provides operators with comprehensive real-time location tracking, three-dimensional dive path recordings, labeling of multiple points of interest (POI), and much more. Paired with the imaging sonar system, QYSEA delivers users an optimal solution for advanced underwater missions, ranging from defense and security to search and rescue.

AN ONGOING MISSION TOWARDS SUSTAINABILITY

Since its 2016 inception, QYSEA Technology's products and solutions have resonated strongly with professionals, industry specialists, and enthusiasts across the marine sector. QYSEA's core mission continues to be driving innovation within the marine industry -built on the foundations of vital research and operational feedback- in ways that best serve its new and long-standing users.

In a technological and fast-changing world, QYSEA aims to redefine the capabilities of compact ocean robotics, bringing the world into a new and exciting era of marine operations and nautical explorations.

info@qysea.com