

Featured Ship of the Year 2023 in Taiwan Taiwan SNAME



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I. Introduction

At the end of 2020, KYLINK met KARMIN through the NCKU Department of Systems and Naval Mechatronic Engineering, and they had common concepts and complementary technologies for the future development trend and market application on unmanned vessels. In early 2021, therefore, the two sides jointly launched the "[Zhilong-1](#)" intelligent navigation unmanned firefighting boat project to develop unmanned self-propelled technologies and system integration service applications.

II. Performance Design

The project was launched in early 2021 in order to develop the remote guidance and control as well as autonomous navigation (IMO L2) intelligent navigation firefighting unmanned vessel "Zhilong-1".

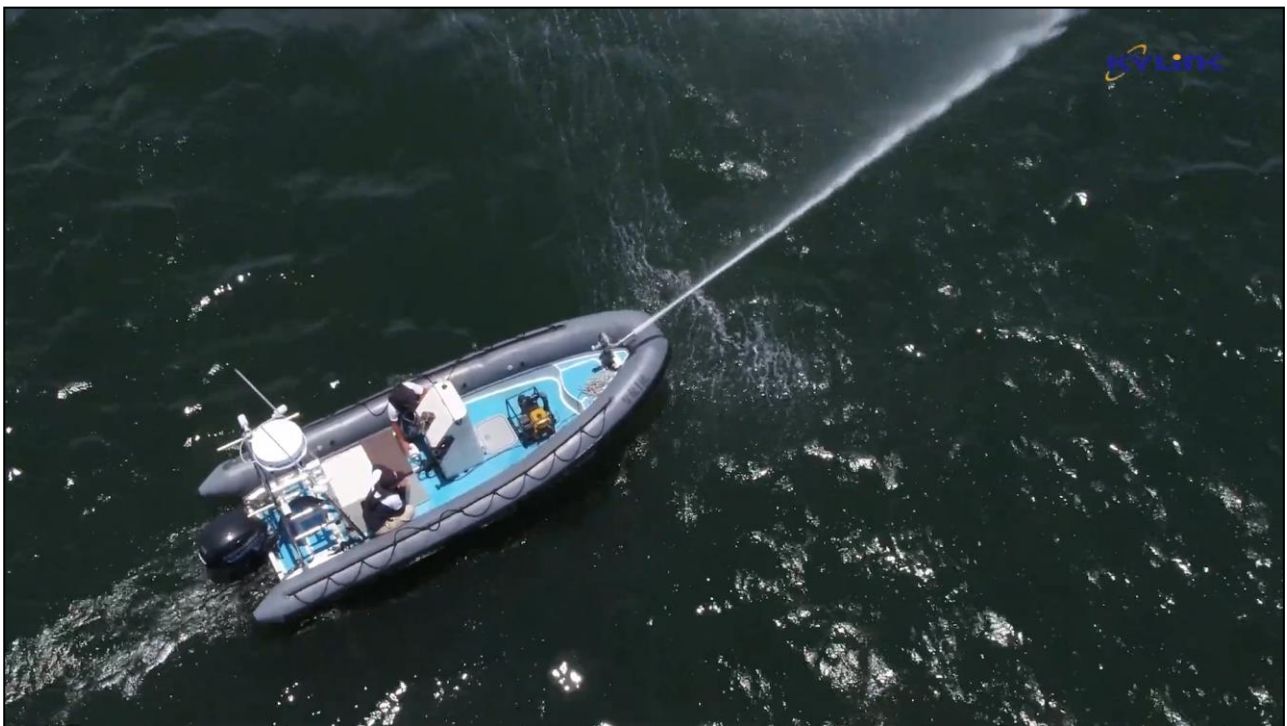
The boat in this project was built by KARMIN, and the structural design, dynamic and static hydrodynamic performance, and production quality control have been certified by relevant units. In terms of the basic performance test of the unmanned boat, the basic performance test of the boat is also carried out by KARMIN at the military level, and in terms of the boat's autonomous navigation collision avoidance and image recognition functions, KYLINK has entrusted NCKU Department of Systems and Naval Mechatronic Engineering to assist in the development of autonomous navigation nonlinear guidance rate and AI deep learning program in the form of industry-university cooperation. KYLINK was also responsible for the navigation instruments, optoelectronic instruments, communication equipment, self-propelled controllers and fire water sights carried on the unmanned boat. Through the sensor fusion (Sensors Fusion) and electromechanical control technology, we are able to achieve the stable and accurate operation of the functions and tasks for the unmanned boat's remote guidance and control unmanned navigation and task loading (fire water sight).



III.Features of Intelligent Navigation Unmanned Firefighting Boat

1. Simple system; and low costs for construction, operation, and maintenance.
Hauled by vehicle, maneuverable deployment, high concealment from parking location;
Or carried by medium and large ships to extend mission range.
2. Collar (Inflatable tubes) from the boat can provide additional buoyancy and good sea resistance.
3. Low boat side and special mast design to make small radar detection range.
4. According to mission requirements, it can be changed/re-equipped accordingly.
5. The system is easy to obtain, low in operation and maintenance costs, high in mobility, good in concealment, and with diversified payloads, which meet the requirements of symmetrical combat requirements.
6. The unmanned self-propelled control, communication system, and boat are all made in Taiwan, which complies with national security/information security regulations, can be researched and modified according to mission requirements or ship types, and are not controlled by foreign manufacturers.

| ZHILONG 1 SPEC | |
|------------------|---|
| BODY | Rigid-Hull Inflatable boat |
| FULL LENGTH | 6.0m |
| WIDTH | 2.2m |
| DRAFT | 0.4m |
| ENGINE | 115HP |
| MAX SPEED | 25 Knots |
| BEAUFORT SCALE | 4 |
| WEIGHT | 900KG(Wet Weight) |
| CRUISING ABILITY | 20HR <small>(@20 Knots(w/Fuel 300 liters))</small> |



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