5G無人潛水器的實際應用
Practical applications of 5G Underwater Robot

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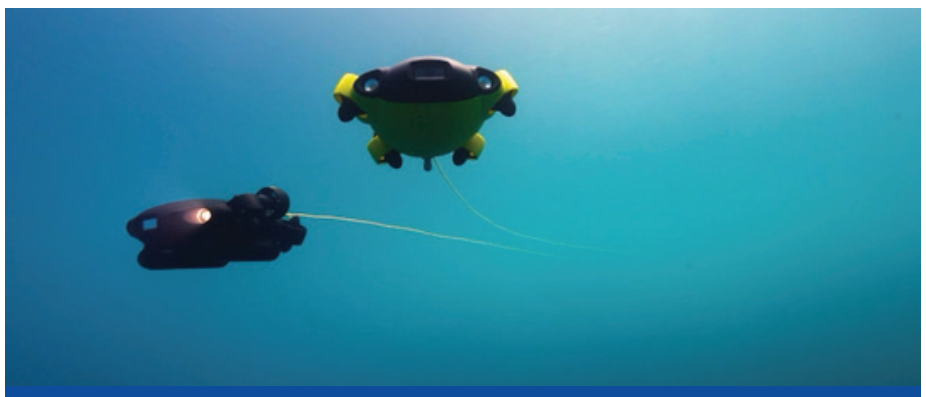
中國港灣將憑借創新意念，改變行業生態。以平台操控以至全自動運作取代水下工程人員的部分工作，提高水下作業的安全性及降低現場管理成本，提供了一個安全、高效的解決方案。

5G潛水器系統更有利採集大量數據及實況並通過網絡進行實際收集及存儲，並且通過5G技術和工程對各類型專業技術人員的遠程協助需求，有利日後相關延伸技術及設備開發，如測距儀、多功能機械臂和聲吶等專業裝備。

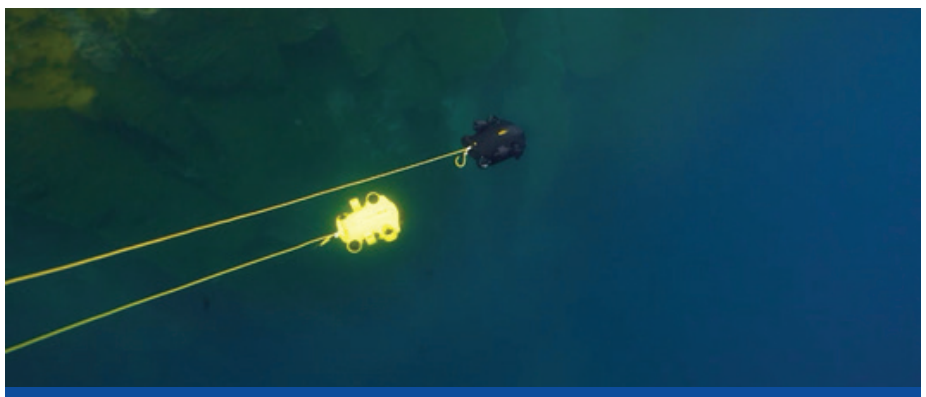
At present,there is no 5G Underwater Robot system used in the shipping or engineering industry in Hong Kong. China Harbour Engineering Company Limited (CHEC)has applied this innovative technology and started to change the industry's ecology. The remotely controlled or even automatic operation of the 5G underwater Robot system will replace part of the diver’ s difficult and dangerous work. As a result, this has significantly reduced the safety risk and the operation costs. This new technology has provided a safe and cost effective solution for much underwater engineering work.

The 5G Underwater Robot system has the ability to collect a large amount of real time data and environmental information, then transfer and store the data through the mobile network. Different professionals and technical personnel around the globe will be able to anticipate and assist the operation remotely via the 5G network. Furthermore, this shared information will provide substantial opportunity for the development of new professional tools such as Surveying equipment, Multi-functional Robotic Arm and Sonar system.

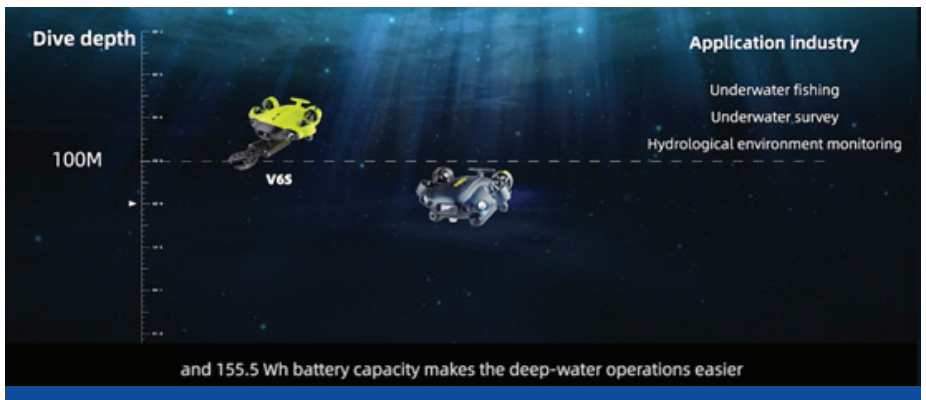
5G無人潛水器在中国港湾船舶維養和海事工程中的應用如下：
CHEC has employed this 5G Underwater Robot System for the following ship maintenance and maritime engineering project：



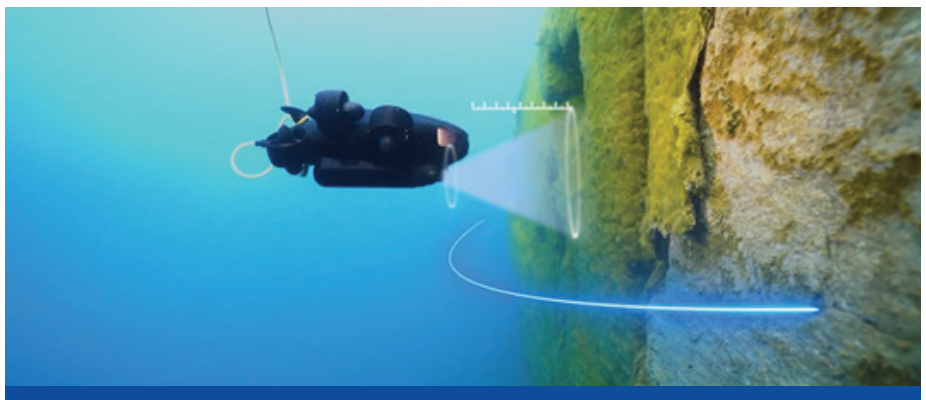
輔助潛水員的部分工作，減少相關人員的水下作業安全風險；
To Assist part of the diver’s operation and reduce the safety risks of the personnel



檢查船隻水下部分（如螺旋槳、海底門和船體）情況，通過實時的視像、輔助設備的測量數據等，使得船舶管理部門和技術部門能夠遠程實時評估其情況，及時制定維修計劃，並能通過遠程操作來清理附著在螺旋槳或海底門上的簡單雜物(機械臂)；
The underwater robot is checking the submersed part of the ship (such as propellers, sea chest and the hull) through real-time video and surveying equipment. The operation team and technical department will be able to formulate a maintenance plan by evaluating its real time situation with feedback from the robot. The operation team can also carry some simple operation remotely like cleaning up the debris that



根據海事工程項目的需要，實現工程和技術設計等工程師能夠遠程進行實時水下工程結構攝影、掃描、機械臂的輔助樣品提取、地盤水質和水溫狀況的檢測和設備配件的打撈等作業；
Base from the project’s requirement, construction and technical design engineers will be able to take photos, scan the underwater construction site, check water quality and measure temperature remotely. The robotic arm can also collect samples and salvage of the surveying equipment；



通過實時遠程視像直播或遠程控制操作進行相應安全、質量和進度的巡檢、驗收和遠程督查等工作，通過影像和數據傳輸讓船舶維修和海事工程專家的實時遠程協助成為可能；
With the assistance of live video broadcast and instructed the operation remotely, the quality inspection, progress review, remote supervision and project acceptance become possible by any expertise around the world with the share of real–time data.；