



The ExRay drone | Photo source [Hydromea](#)

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'WORLD'S FIRST WIRELESS UNDERWATER DRONE' REPLACES TETHER WITH LIGHT

 SCIENCE

Hydromea's ExRay drone transmits data through the water using rapid pulses of 470-nanometer blue LED light

Spotted: Until now, a major limitation in the operation of underwater, remotely-operated vehicles (ROVs) has been the need for a tether. As radio waves do not travel well underwater, ROVs need to be linked to the surface by a long cable. This cable can be quite heavy, and so a large ship is also usually required – increasing the costs of the operation. Now, however, Swiss startup Hydromea has come up with an alternative — a drone controlled by light.

Hydromea's ExRay drone, [which is being billed as](#), “the world's first wireless underwater drone,” uses the company's Luma X underwater communications system. This transmits data through the water using rapid pulses of 470-nanometer blue LED light. The light pulses are transmitted between two optical modems, one located on the ROV and one at the surface, at a rate of 10 megabits per second. This is enough to allow HD video from the ExRay's onboard camera to be relayed with virtually no lag.

The ExRay is intended to replace a multi-person manned entry into dangerous, confined underwater spaces, such as ballast water tanks vessels. Removing the tether would allow the drone to navigate these spaces without getting tangled, increasing the safety of the operations, while reducing the cost. This is no small matter — the market for ballast tank inspections is estimated to be worth £2.36 billion.

Igor Martin, the co-founder and CEO of Hydromea, has described the uses for the Luma X system, [saying](#), “Radio waves do not penetrate water well, so resolving high-bandwidth communication underwater, for streaming high volumes of data, is a huge challenge. With our focus on

miniaturization and scalability, LUMA X is the first optical device of its kind in such form factor with these impressive characteristics.”

While much of the focus on drones has been on their above-ground uses, a wide number of them are being developed and deployed for underwater tasks as well. In addition to the ExRay, we have also recently seen autonomous drones used for [collecting rubbish](#) from the ocean floor and [miniature drones](#) adapted for use underwater.

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Takeaway:

The Luma X and its application in the ExRay is set to revolutionise underwater work, and could have a major impact on not just shipping, but also on underwater construction and the maintenance, for example, of offshore windfarms. These uses will need to wait, however, as the technology currently has a maximum communications range of 50 m (164 ft) in clear water and less in conditions of lower ambient light and higher turbidity. However, the company is working to develop a range of at least 100 m (328 ft). In the meanwhile, the current range should be enough for enclosed-space tasks.