IOT PRESERVING ANCIENT UNDERWATER TREASURES

SUMMARY

At the beginning of 2019, the design of the Underwater Visual Observation System NOUS was born. The system got installed at the ancient shipwreck of Peristera, at Alonissos island, Northern Sporades. For the first time in the world, it enabled continuous monitoring of an underwater museum. As a breakthrough in underwater surveillance, such a system could have many other possible applications, including monitoring of marine protected parks, sea farms, scientific observations for biodiversity and climate change, and many more.

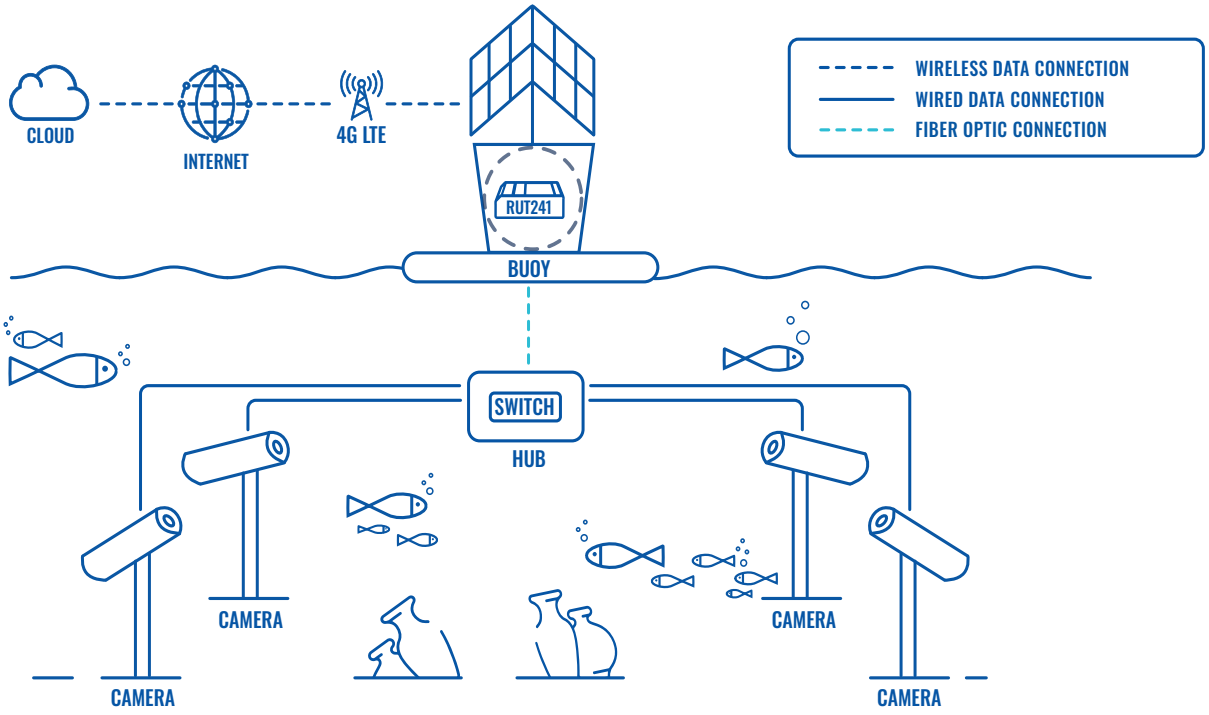
CHALLENGE

Although the underwater world offers a lot to be seen, underwater museums are not a common phenomenon. One of the main problems that withheld the implementation of underwater museums was related to the complicated protection of such entities. Usually, in ancient shipwrecks, only the cargo is preserved, which is mainly amphorae. Such treasures are attractive to thieves as they are easy to steal and quick to sell. Therefore, before showcasing these objects to the visitors, a security system needs to be installed that is self-powered, remotely controlled and connected to the network 24/7.

PARTNER - NOUS

uNdersea visiOn sUrveillance System or NOUS (“NOUS” means “mind” and “intelligence” in Greek) is an innovative system prototype that can continuously monitor an underwater area of interest. It combines Artificial Intelligence for the marine and diving industry, eliminating the need for a human operator to perform tasks like object detection, image classification, monitoring, and others.

TOPOLOGY



SOLUTION

The NOUS system allows continuous monitoring and protection of an underwater site using machine learning and applying image and sound processing algorithms. The system consists of two sections: above and under the water. Onshore or placed on a buoy is a fully autonomous photovoltaic panel system and batteries that provide electricity to the solution. There is also a RUT241 router providing internet via the 4G network, which further travels underwater through the fiber optic cable.

The underwater section consists of five cameras and a switch. All cameras send video streams in real-time for processing to a remote station via the internet. The image recognition software alerts administrators instantly if anything out of the ordinary occurs and may cause danger to the wreck. The algorithms help the system recognize and detect divers, remotely-controlled robots, or the slightest source of light in the dark. Any alterations on-site trigger a message sent to a group of recipients for investigation and further action if needed.

BENEFITS

- Broad input power range allows connecting photovoltaic directly to the router.
- The small size makes it perfect for easy installation in solutions where space and weight are limited.
- Wide operating temperature of -40 °C to 75 °C and humidity levels from 10% to 90% make it suitable for use on a buoy close to water.
- Advanced VPN services, including OpenVPN, ZeroTier, Stunnel, and many more, keep the data private and secure.
- Compatible with RMS for convenient remote management, real-time data monitoring, analytics, and event alerts.

WHY TELTONIKA NETWORKS?

Teltonika Networks offers a wide range of heavy-duty routers, with some essential characteristics required for specific projects. For example, RUT241 enables powering directly from photovoltaic panels as the input power ranges from 9 to 30 V and the router may also work as a switch. Some other models may work simultaneously with 2 SIM cards providing even more application opportunities and ensuring connection continuity for the most demanding IoT projects.