Enhancing underwater communication – The Buddy Watcher

Who isn't familiar with the situation of trying to catch and pull your dive buddy's fin tip to alert him of something you have seen or you want from him? You could either have a cramp in your leg or an empty tank which would both make this endeavor not an easy one, or you might just want to show him the Great White shark, the blue whale or the pygmy seahorse he just missed. Five years ago, three start-up entrepreneurs and engineers from Southern Germany developed an ultrasound system, to improve and facilitate underwater communication between dive buddies in a silent manner. The device, called **Buddy-Watcher**, made its way to the finals of the 2015 Cyber-One Awards. It has the size of a dive computer and can be worn around the wrist. Experts from DAN Europe tested it to check if this can also be considered a valuable diving safety tool. Here is what they found.

Sophisticated technology

The Buddy-Watcher UW communication system operates with soundless signaling via **ultrasound**. The signal is transformed into a haptic-visual one, sparing other divers and the underwater environment nerve-wrecking noises. Devices need to be paired before the dive. Call to the dive buddy can be made by pressing one of the two large keys. The ultrasound is immediately transmitted underwater, making the buddy's device vibrate. **Vibration** is coupled by **red LEDs flashlights** on the display.

Comparison with other safety items

This electronic device distinguishes itself from mechanical UW tools generating rattling noises by shaking pieces of metal, such as shakers or metal rods, also called "tank bangers". However effective metal noise may be underwater, the more intrusive is the cacophonous, noisy underwater concert that is caused by it. The Buddy-Watcher, instead, transmits its signal discreetly and selectively. Thanks to its characteristics, the device is indicated for divers with impared hearing, and may also be good for kids who are often distracted. Diving schools could use it for underwater training.

Special features

According to DAN experts, the ultrasound signal functions properly. The manufacturer warrants a **range of 20 metres** – a way too long distance for dive buddies! Waterproof **up to 40 metres depth**, it's suitable for recreational SCUBA divers but not for technical divers.

As the Buddy-Watcher alert is activated, the buddy knows that his attention is required, meaning that either the diving companion needs help or he wants to show or communicate something.

The **master function** enables sending signals from one device to several receiving devices at the same time. This feature is ideal for dive groups and for instructors, guides and divemasters looking after several students or clients. The group leader can grab the attention of all divers with a simple click, in order to practice skills or to communicate something else.

According to the buddy system, no diver should be distracted or without reach. However, we all know that this happens frequently. Statistics show that in about **40%** of dive fatalities the dive buddy was out of reach. We like to think that a system such as the Buddy-Watcher could have prevented at least some of these fatalities.

Space for improvement

The Buddy-Watcher is not designed as a safety device or a buddy-finder, it is a **communication tool**. Consequently, it cannot retrieve a missing diver. Like each newly-developed product on the market, it is still improvable and extendable. DAN experts who tested it suggest to add a feature showing the precise **location** and the **direction** towards which the divers is going.
To avoid buddy separation, divers could also set a **fixed distance** between devices (3, 5, 7 metres or more). If buddies separated and went beyond this distance, the alarms of both devices would go off and remind them to stick together. This feature seems to be planned for a future release of Buddy-Watcher. Safety relevance would largely increase and could allow dive buddies to reunite even when visibility is poor.

DAN experts also point out that the buddy who makes the call does not receive a **confirmation signal** and doesn't know whether the receiver actually got it. He can only understand it from his buddy's reaction. In moderate or low visibility this could be problematic. Loosing sight of the buddy would push the diver to start a search and eventually surface if the search is not successful after one minute (diving rule!). It would be ideal to have a **bidirectional communication**, with the receiver confirming the call by pushing the same button, or to have at least two different buttons meaning different messages: one for grabbing the buddy's attention, and one for real emergencies. "Further developments are on their way", reassured engineer Eduard Sabelfeld, one of the product developers. And we believe him, as with the implementation of some features, such as localisation of buddy, larger range and greater depth, the Buddy-Watcher could be used as a valuable safety tool.

Practical info

At full loading capacity the **battery** (3.7 Volt, 900 mAh) will last for about four dives and can be recharged via USB cable. Transmission frequency is between 60-70 kHz. There are two sizes of wrist straps: a standard one and an XXL wrist strap especially designed for dry suits. One device costs about **100 Euros**. Obviously, to use the Buddy-Watcher system at least two devices are necessary – and, of course, a dive buddy!

Conclusions

Overall, the Buddy-Watcher is a good UW communication tool addressed to recreational SCUBA divers, a sort of electronic shaker which could avoid buddy separation and thus prevent potential accidents. Clearly, using the device does not prevent divers from respecting the basic safety rules, such as staying within reach of your dive buddy and paying close attention to one another.

The call button is large and intuitive, and this could prove to be crucial in an emergency. Perception is not via the acoustic channel but haptic and therefore also suitable for divers with impaired hearing as well as for inattentive children. The vibration alarm is noticeable even through a dry suit or a thick layer of neoprene (up to 10mm). The wireless and ropeless system offers a comfortable, silent dive with selective and effective communication and without entanglement.

The use of the Buddy-Watcher is ideal when diving in good or medium visibility. Divers who want to communicate with their dive buddies without stressing out may enjoy the use of this device. Although this is "just" a communication tool, it has the potential to become a more comprehensive safety aid, when empowered with further features and functionalities.

Producer: Free-Linked Ltd

Disclaimer

DAN is by no means connected to the producer, does not have a business agreement with Free-Linked Ltd, nor did it receive any compensation for testing the device and for writing about it. DAN experts were happy to test the Buddy-Watcher, as they would be testing any new item having the potential to act as a safety tool. If you want to submit a new item for review by DAN experts, please write to communications@daneurope.org