



## CASE STUDY

# TU Delft Hydro Motion Team achieves world-first hydrogen-powered traverse of the North Sea with Panasonic TOUGHBOOK

*Historic journey highlights the urgent need, but also possibilities, for the maritime sector to adopt clean, sustainable fuels.*

Product(s) supplied: **TOUGHBOOK G2 mk3 Standard**



## The mission of a generation

As the oldest and largest public technology university in The Netherlands, the Delft University of Technology (TU Delft) is already globally renowned for its engineering, design, and technological capabilities. Its Hydro Motion Team has developed 15 boats to-date in its ongoing quest to help the maritime sector transition to cleaner energy – including winning the 2023 Monaco Energy Boat Challenge.

“The maritime sector is currently a major consumer of fossil fuels, and our ultimate goal is to help them to quickly move towards a greener future. Hydrogen offers so much potential for the maritime sector and we hope that our project will demonstrate the feasibility of this clean fuel,” comments Daan Posthumus, Chief Embedded Systems of the TU Delft Hydro Motion Team.

However, they have only just scratched the surface. The TU Delft Hydro Motion Team needed another challenge that would push them to their limits: building a hydrogen-powered boat to cross a 169 kilometer-stretch of the North Sea, from the Breskens Harbour in The Netherlands to the port of Ramsgate in the United Kingdom.

To achieve this, simply developing and building a new boat was not enough; the hardware required would need to withstand the harsh and unforgiving waters of the North Sea. This led the TU Delft Hydro Motion Team to turn to long-term sponsor, Panasonic, to use its rugged and reliable TOUGHBOOK G2 2-in-1 detachable tablet.

*"With TOUGHBOOK we can keep an eye on everything, even in rough conditions such as on the North Sea."*

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**Daan Posthumus**

Chief Embedded Systems  
TU Delft Hydro Motion Team

## Rough waters, rugged hardware

To optimise performance, manage resources, overcome obstacles, analyse mission-critical data, collect information and communicate on land and sea, the team needed reliable technology that can deal with blinding sunlight and high moisture levels, as well as shocks and drops – whilst still working seamlessly.

"The [TOUGHBOOK G2 tablets](#) are mainly used in the embedded systems department," Posthumus adds. "The boat contains many new concepts and components for which we have developed special programs to monitor them. These include simple systems that indicate whether a switch is on or off, to more sophisticated systems that continuously monitor the hydrogen concentration in the boat."

## Surfing the Windows wave

The TU Hydro Motion Team utilised two [TOUGHBOOK G2 tablets](#), utilising one with a keyboard for programming purposes, and a standalone tablet for monitoring.

"We tested both configurations of the G2 on the shore and water, opting to use the tablet at sea, and the G2 as a traditional notebook on the dinghy that accompanies the hydrogen boat. The data collected during testing is analyzed, enabling us to see whether a certain test is working well or whether we need to intervene. We can then continue programming from the dinghy and adjust settings, and immediately view the results. We've found that the Windows operating system is perfectly suited for programming," adds Posthumus.



*"We can't afford things to break halfway. That's why we use Panasonic TOUGHBOOK."*

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**Daan Posthumus**

Chief Embedded Systems  
TU Delft Hydro Motion Team





## Connected from shore to shore

It's critical that the team's G2 devices are continuously connected to the boat's systems, both during testing and the journey itself, explains Posthumus. "The **TOUGHBOOK tablets** are used during the crossing to check the boat's systems. We have never sailed on the open sea for such a long time and therefore we have to keep a close eye on how all the systems are functioning in order to be able to intervene quickly before potential problems arise."

"As the North Sea is one of the busiest shipping lanes in Europe, it's imperative that we knew if any systems are experiencing problems that could affect the boat's propulsion, as soon as possible. It is therefore essential to use reliable mobile computing solutions that will continue to operate in any environment, regardless of the conditions and stability of the boat. A long battery life is also very important because we cannot allow the tablet to turn off when we are at sea," adds Posthumus.

After an intense testing period, the TU Delft Hydro Motion Team successfully crossed the North Sea to the United Kingdom in July. "It's fantastic that students can come up with smart solutions that contribute towards a greener future with our **TOUGHBOOK tablets**. Once again, we send our congratulations to the students for their great achievement," concludes Pierre van Zon, Channel Development Manager for TOUGHBOOK Benelux.

