

# TNO at Holst Centre and 2M Engineering launch health patch platform

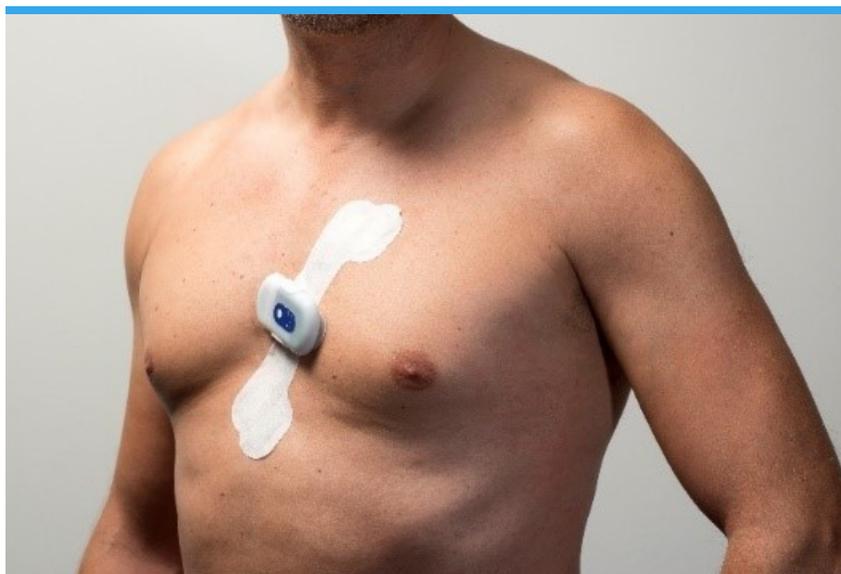
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TNO at Holst Centre and 2M Engineering have jointly developed a Health Patch to monitor vital signs, allowing patients to leave the hospital earlier and recover at home in a comfortable and safe manner. At the core of this next-generation platform is a Wearable Health Patch and optimized algorithms to translate the measured vital signs into usable clinical data. This platform will help healthcare companies around the world to bring customized wearable devices to market, targeting pre- and post-operative monitoring, ambulatory monitoring and a variety of specific conditions such as Chronic Obstructive Pulmonary Disease (COPD), Inflammatory Bowel Disease (IBD), and for the remote monitoring of Covid-19 patients. Furthermore, because of its modular design, additional vital function measures can be integrated, such as oxygen saturation and vascular dynamics.

Ashok Sridhar, Senior Business Developer at Holst Centre: "*The Wearable Health Patch can measure vital signs continuously for up to seven days without hindering the wearer's day-to-day activities, including showering and physical activity. The reusable read-out module enables long-term monitoring, resulting in much lower total cost of ownership compared to the current devices in the market.*"

## **Wearable Health Patch: Differentiating features**

The Wearable Health Patch consists of a disposable sensing patch and a re-usable read-out module. It has a single-lead ECG, electrodes for bio-impedance measurement, an accelerometer and a temperature sensor. Using these sensors, heart rate, heart rate variability (HRV), respiration rate and depth, posture and skin temperature can be measured. The measured data can be transmitted wirelessly via Bluetooth or can be stored on-board for post-processing.



The Wearable Health Patch is the culmination of several years of research by TNO at Holst Centre and 2M Engineering. Innovative aspects of the Health Patch include dry electrode technology for gel-free skin contact to enable long-term clinical quality data acquisition, a unique stretchable patch stack that allows the skin to breathe and to adapt to the shape of the human body. The read-out unit was designed and developed using commercial off-the-shelf components that ensure shorter lead times for customers interested in bringing the device to market. Energy-efficient read-out electronics can provide seven days of battery time on a single charge and continuously record vital sign parameters. The device is also water-proofed to accommodate normal daily usage.

## **Cost-effective solution for long-term monitoring**

After multiple volunteer trials, TNO at Holst Centre has developed the expertise to determine different positions to wear the patch on the human body, based on different application needs.

Marcel van Zandvoort, Senior Business Development Manager at TNO Healthy Living: *"Through the partnership with TNO at Holst Centre and 2M engineering our wearable sensor program uniquely combines technological innovations with expertise on biological processes and biomarkers of disease, access to relevant clinical study cohorts, as well as behavioural aspects of optimizing implementation and practical use of this technology by specific target groups. The health patch device is deployed for a clinical validation study into monitoring disease development and the exacerbation of risk in patients with chronic diseases such as COPD and IBD. Therefore, vital-sign data acquired with the health patch can be correlated with conventional clinical and biochemical parameters that reflect disease status or activity. In conjunction with a data science platform, specific algorithms are developed based on the integrated vital function measurements in order to monitor disease risk and the status of the disease with higher sensitivity."*

Coen Lauwerijssen, Director Product Creation & New Business at 2M Engineering: *"Since our foundation in 2004, we have forged worldwide partnerships with the best-in-class research organisations and industrial partners. In the meantime we have built state-of-the-art expertise in the development of algorithms that are used to read out sensors in wearables and medical devices and to translate this data into usable, clinical data. We support our clients in (part of) their journey from idea to product development, certification and production. I strongly believe that our knowledge of algorithms and product engineering will contribute to the success and application possibilities of the health patch."*

To learn more about the platform and how the device can be customized to meet your application requirements, please contact:

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