

## Press Release - Background Report

### **The 2023 COMPAMED Innovation Forum: This is why high-tech sensor technology is crucial for health care!**

The cost of health care is rising the world over, and in almost all OECD member states, it is rising even faster than their ability to keep up. Modern technologies can at least help to mitigate this development while ensuring at the same time that the quality of care does not suffer and that staff (see “lack of skilled workers”) is given a respite. This is especially true of sensors which play an increasingly important part in medical technology to make medical devices even more powerful and safe, and to simplify their operation. How to achieve this and how high-tech sensor technology can also contribute to innovative prevention and personalised treatment was discussed at the COMPAMED Innovation Forum 2023 on 12 June. This digital forum, organised by Messe Düsseldorf and the International Microtechnology Business Network IVAM, is held every year and, according to Dr Thomas R. Dietrich, managing director of IVAM, its purpose is to be “a platform for research and entrepreneurship, to form partnerships and drive innovations forward”.

The importance of this year’s topic is demonstrated by the numbers alone: According to the market research institute Mordor Intelligence, the global market for medical sensors was estimated at 6.02 billion US dollars in 2021 and will reach USD 10.28 billion by 2027, which corresponds to a growth rate of almost 10 percent over the time period from 2022 to 2027. The development of new devices which guarantee a faster analysis, potential savings and easy usability all contribute to this growth for medical sensors.

Chronic diseases like diabetes, cardiovascular diseases and asthma can be efficiently monitored using modern sensors so that deviations can quickly be recognised and treatment can be adapted to a specific goal. In their presentations at the COMPAMED Innovation Forum, leading international experts showed actual examples of how modern sensor technology can be integrated into medical aids, diagnostic or treatment devices.

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## Multi-functional sensor nodes to reduce nosocomial infections

Hospitals and care institutions are not only places of healing and maintaining health, but again and again become sources of infection themselves. Infections occurring during treatment in health care institutions, so-called nosocomial infections, happen in all outpatient and inpatient areas of care. According estimates by the Center for Disease Control (CDC), in American hospitals alone, 1.7 million people are directly affected by such infections every year, which correlate to 100,000 deaths. The situation is no better in Europe: The European Centre for Disease Prevention and Control (ECDC) estimated the annual total number of nosocomial infections (NI) in Europe at 8.9 million as early as 2018, of which 4.5 million occurred in hospitals and 4.4 million in long-term care institutions. Every year in the EU countries, more than 90,000 people die of the six most common nosocomial infections in the health care sector, especially urinary tract infections (32 percent), infections at the operation site (22 percent), pneumonia (15 percent) and bloodstream infections (14 percent).

The Greek company ES Systems has therefore developed a system of sensor nodes for use in medical facilities that collects data in real time and identifies potential microbiological contaminations. The system is based on sensor nodes, a gateway and a cloud. The sensors connect to a local gateway using “LoRaWAN” (“long range wide area network”) communication, connection to the cloud is realised through a simple QR scan. The installation is very easy, and depending on the data rate, autonomous operation is possible for up to a year. The sensor nodes measure environmental parameters like temperature, pressure, humidity and intensity of light, but also the concentration of carbon dioxide, VOC (volatile organic compounds), particles and the presence of persons. In a pilot application at a Greek hospital, three operating theatres, three reception areas, two patient rooms and one nurses’ station were fitted with the sensor nodes. Intelligent evaluation of the large data volumes makes it possible to draw good conclusions regarding the contamination situation. Some improvements were already achieved by replacing air circulation devices and filters in the operating theatres: “The particles monitored were reduced and thus the patients’ risk of infection was decreased”, said

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Nikolas Valantassis, Business Development Manager at ES System, in his presentation. The pilot run shows that the use of sophisticated sensor technology could noticeably decrease the risk of nosocomial infections.

### **Laser diodes for measuring blood sugar levels – low-cost and painless**

Trumpf Photonic Components already has more than 20 years of experience with miniature laser diodes, so-called “VCSEL”, meaning “vertical cavity surface emitting laser”. These are already being used today for smartphones and smart watches, digital data transmission and autonomous driving. As the global market leader in VCSEL, Trumpf now wants to use the diodes to help diabetics measuring their blood sugar levels. The goal is a revolutionary, non-invasive portable sensor that is low-cost and monitors blood glucose levels without causing any pain. The basic principle of photonic components by TRUMPF is a monochromatic, polarised light source that shows an inelastic dispersion of light in the near-infrared spectrum between 785 and 1,066 nanometres. “While today’s solutions rely on the Neodym YAG laser with a wavelength of 1,060 nanometres, we see great advantages in Raman spectroscopy. At approximately 800 nanometres, its wavelength is ideal for measuring glucose, because interfering fluorescence is low, dispersion is sufficient and the laser energy is only moderate”, says Dr Cynthia Klett, product manager at TRUMPF Photonic Components.

According to data from the International Diabetes Federation, across the world, 540 million people are living with the metabolic disease diabetes. By 2030, this number is expected to rise to 643, and by 2045 to 783 million. As of now, diabetes has caused global health expenses of almost 966 billion dollars. VCSEL lasers pave the way for a glucose sensor at the wrist which will make the lives of affected people much easier.

### **Impressive outlook for topics at COMPAMED 2023**

“Sensor technology for prevention and personalised therapy” – that was the headline of this year's COMPAMED Innovation Forum. The examples demonstrated at the event offered an extensive preview of the content for

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COMPAMED 2023 in Düsseldorf and were also an impressive demonstration of the breadth of technologies and applications that has become so characteristic for the professional trade fair COMPAMED over the years.

“The importance of sensors for medical technology cannot be overestimated, as they are the basis for precise diagnoses, effective treatments and improvements within patient care. The future developments of sensor technology within medical technology promise a growing breadth of applications, from implantable sensors for monitoring chronic diseases to compact wearables that can be worn on the body and continually monitor people’s health in a way that is reliable and saves money”, says Dr Thomas Dietrich, CEO of IVAM, in his summary of the COMPAMED Innovation Forum 2023.

If you want to see for yourself what medical technology industry suppliers are capable of beyond the field of sensor technology, the best option is COMPAMED 2023 (from 13-16 November) in Düsseldorf, in the trade fair Halls 8a and 8b. In five different worlds of experience, more than 700 exhibiting companies present their wide range of high-tech and service solutions. The five worlds of experience are: Manufacturing & Devices (e.g., components, parts, manufacturing processes), Services & Advice (e.g., research, development, services), Materials (e.g., plastics, glass, ceramics, metals, composite materials, adhesives, packaging), Micro Tech (such as micro components, microfluidics) as well as IT in Tech (software development and maintenance for medical technology).

According to the fixed schedule, COMPAMED 2023 will again take place concurrently with the internationally leading medical trade fair MEDICA 2023, which this year is again expecting more than 5,000 companies that provide medical products and technology.

Information about COMPAMED 2023 online:

<https://www.compamed-tradefair.com>.

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