

COVID-19 as innovation driver



For residents of care homes, the regular nightly rounds, where nursing staff enters the room to physically check on the residents well-being, are often the cause of a poor night's sleep. This frequently leads to health or mental issues for the elderly resident and causes stress to the nursing staff. To avoid these sleep interruptions, while enhancing the monitoring possibilities of the staff, **P.SYS caring systems** has developed the **Bed Monitor**. It uses advanced non-invasive sensing technology with embedded

local artificial intelligence to monitor the sleeping residents. The nursing staff receives real-time physical and status information.

The **P.SYS bed monitor** consists of four sensor pads which are placed under the bed and connected to an evaluation unit. The pads measure body induced vibrations through the bed.

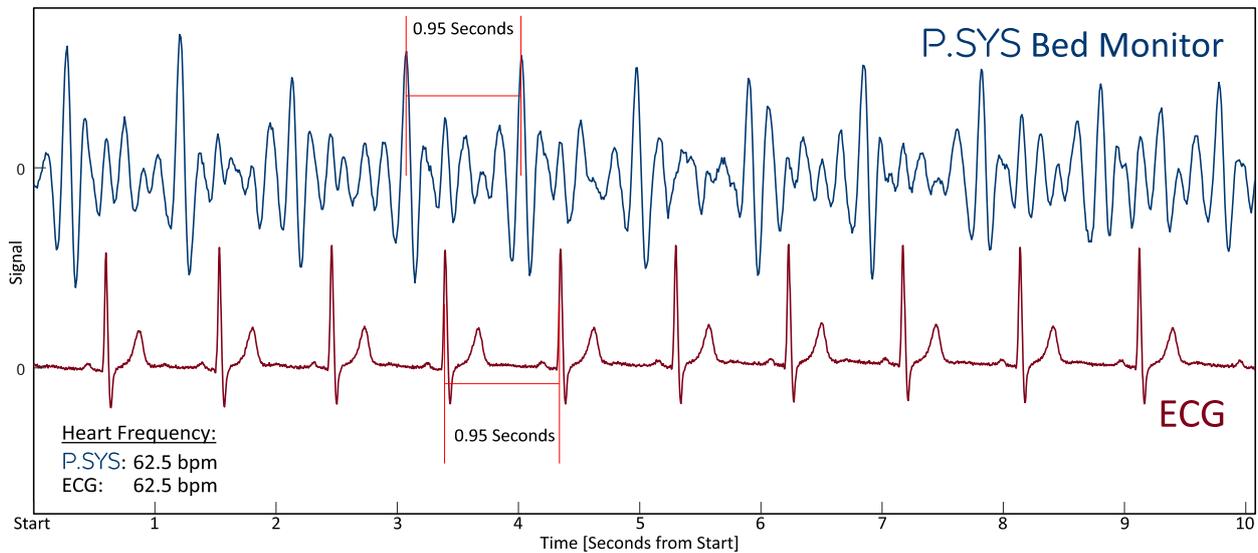
Self-learning adaptive technology in each evaluation unit, locally builds an individual behavior model for each resident and evaluates their current status fully autonomously.

Nursing staff can observe each residents status at a central Care-Station monitor or by using a mobile device. This enables non-intrusive virtual checkup rounds. Alerts can be given when abnormal situations are detected, allowing focused care to where it is most needed.



The bed monitor is currently in test at three care and nursing homes in Carinthia. Further installations are planned in the Netherlands and in Italy. The data from these pilot installations helps to further develop the bed monitor capabilities and has shown possibilities beyond the originally planned applications.

In addition to giving information on the current status of a resident to nursing staff, the Bed Monitor allows determination of important physiological parameters such as heart rate and respiratory frequency. Known clinical conditions were clearly visible in the data. The monitor shows true po-



tential to specifically track the progression of medical conditions such as cardiovascular and chronic lung diseases.

The potential to develop the bed monitor into a medical device is investigated further by P.SYS and its development consortium.



After the first outbreak of COVID-19, many emergency facilities were established for the care of corona-sick people. Especially in developing countries, these facilities are rarely adequately staffed and equipped.

The highly infectious nature of the virus mandates that direct contacts between staff and patients must be minimized. Still, available staff must provide immediate and focused care whenever it is required.

These requirements are quite similar to those encountered in nursing homes.

P.SYS has been requested to re-configure the Bed Monitor for use in such emergency facilities, especially for countries where adequate healthcare is challenging. The main goal is a simple, cost-effective and efficient monitoring solution, which gives caregivers a real-time overview of large numbers of patients while directing attention to patients in need of immediate help. For this use case, the Bed Monitor evaluation unit is connected to a common signal (traffic) light. This then replaces all data infrastructure and "Care Stations" whereas green, yellow and red represent the condition of the patient and indicate exceptions.

Since none of the components of the Bed Monitor system come into direct contact with the patient, extensive disinfection or component replacement is avoided. Direct contact between pa-

tients and staff is reduced to a minimum. Especially in developing countries, where emergency facilities are established in areas without stable energy supply or internet access, the re-configured Bed Monitor provides an efficient way to monitor many COVID patients.

P.SYS caring systems is currently negotiating with potential partners for this COVID project (INFO@psysengineering.com).

The P.SYS Bed Monitor is being developed and tested as part of the Detect & Connect project, funded with support of the Austrian Research Promotion Agency (FFG) and the Carinthian Economic Promotion Fund (KWF). The project is conducted with the help of an international consortium of research institutes, care providing organizations and technology providers.

The P.SYS Bed Monitor is the first product of the Detect & Connect series and can be used as stand-alone unit or as part of complete living space monitoring system (www.psysengineering.com/care).

The first market entry of the P.SYS Bed Monitor is targeted at Q4 2020 with the help of a AWS Pre-Seed funding (Austria Wirtschafts Service).

