

Emfit Oy

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**NEW IP-BASED NURSE CALL SYSTEM WITH ASSISTING
NON- BODY-CONTACT VITAL SIGNS, MOVEMENT
ACTIVITY, FALL, AND EPILEPTIC SEIZURE MONITORING**

Finnish Emfit Ltd, world leading ferroelectret sensor and related embedded sensor systems manufacturer, has developed a new IP-based nurse-call system platform. System integrates common patient peer-button and nurse-present/nurse-needs-assistance buttons with assisting bed monitoring using multi-patient, long-use under-mattress sensor. New DVM (discreet vitals monitoring) technology senses and calculates patient approximate pulse and respiration rates as well as movement activity and even epileptic tonic-clonic seizures from below mattress. System uses standard IP protocol for connecting to LAN, and can be used with adults and children.

Düsseldorf, Medica Exhibition, 14-17.11.2007 – Emfit Ltd presents at Medica its new IP-based non-body-contact vital signs monitor and nurse-call system. Emfit's DVM™ (discreet vitals monitoring) technology measures basic physiological parameters (pulse rate, respiration, movements) passively, from below the patient's mattress, without the use of electrodes, leads, cuffs or cannula. It is a versatile system that can be used for various notifications, monitoring and vitals trend tracking needs in establishments such as hospitals and retarded people care, elderly people care, and mental care. Besides input for Emfit's dynamic, thin-film under-mattress sensor, system has inputs for patient-peer-button, equipment with dry-contact output, and nurse-present/nurse-needs-assistance buttons.

Emfit's DVM technology is developed to enhance the caring environment for the patients and the nurses. There are always patients who need nurse's special attention - like those who should

not leave the bed without a helping hand, but who often cannot use the peer-button. Also nurses need to check patient's condition while in sleep and often wake them unnecessarily. DVM technology lowers the workload of nurses, patients' falls and wanderings, and costs associated with patient monitoring in general. It brings better rest and safety for patients. The DVM system makes most of the calculus of different measurement parameters and events at the embedded electronics at bed side and thus produces minimal amount of data in order not to load the LAN or the server.

Heart and respiration strengths, rates, movement activity and various alarms and nurse acknowledgements are logged and stored in the server. This allows tracking vitals and movement activity trends over long period of time.

DVM technology consists of Emfit's proprietary, patented dynamic thin film sensor, installed below mattress, and a digital signal control unit interfaced with LAN. The self-biased sensor responds to small pressure changes caused by patients BCG (ballistocardiogram) and respiration movements and generates a respective output voltage signal. Digital signal data acquisition unit uses Emfit's patent pending algorithms in calculating heart and respiration rates, strengths, and movement activity from the sensor signal.

System alerts the nurse with various user-preset parameters; for example when a patient pushes the bed-side peer-button, leaves the bed, or gets a seizure with muscle jerking, lasting over a preset time. It is also possible to generate several other types of alerts in the computer software, which also records and visualizes the vital signs and motions. System can alarm for example of a too low motion activity, to prevent possible bedsore.

"We started to develop this product concept in 2003. The most challenging job was to develop the algorithms to accurately calculate the pulse and respiration rates in real time from our under-mattress-installed dynamic thin film sensor. Also the software solution to control multiple beds and transfer alarms to nurses via new thin-client type displays was challenging. Easier parts of the years of development were complementing the bed side device with patient and nurse buttons. Our goal was to develop a whole new concept for care environments of multiple low

risk patients, and use standard LAN and WLAN infrastructure; a new-age nurse call system with assisting non-diagnostic monitoring. The intended use of our product is not, however, monitoring of vital physiological parameters, where the nature of variations is such that it could result immediate danger to the patient. We see big potential for this product in hospitals, elderly- and retarded people and mental care.” says company CEO Heikki Räisänen.

About Emfit Ltd

Emfit Ltd was founded in 1990 and is the world leading ferroelectret sensors and related embedded sensor systems manufacturer. Company is located in Finland, Germany and USA.

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