

The **EPOSbed™** product consists of a specialty bed with automatic positioning, driven by intelligent software.

EPOSbed™ allows patients with limited mobility to change their position in bed without the need of assistance from hospital personnel. In **EPOSbed™**

, the patient is able to command the movements of the bed with slight body movements. No need to use a remote controller or human assistance.

Intelligent software permanently monitors the pressure map of a mat sensor embedded into the mattress of the bed. The software detects and anticipates in real-time the patient's intention to move and acts consequently. Bed movements are smooth, interactive and reliable since the system is performing continuous control from the feedback signals of the patient. In order to move in one direction, the patient just needs to move slightly and naturally in this direction. To stop an initiated movement, it is sufficient to do a similar pressure in the opposite direction. In consequence, the interface with the bed actuators is straightforward and well suited for persons with reduced mobility. In addition, the **EPOSbed™** system offers a complete remote controller to be used by caregivers.

The **EPOSbed™** system was validated in pre-clinical trials with different types of persons; including: man and women, different weights and different heights. Results from these tests have been very successful since, almost without any exception, all people interviewed recognized **EPOSbed™** is a natural and attractive way to interface with the bed.

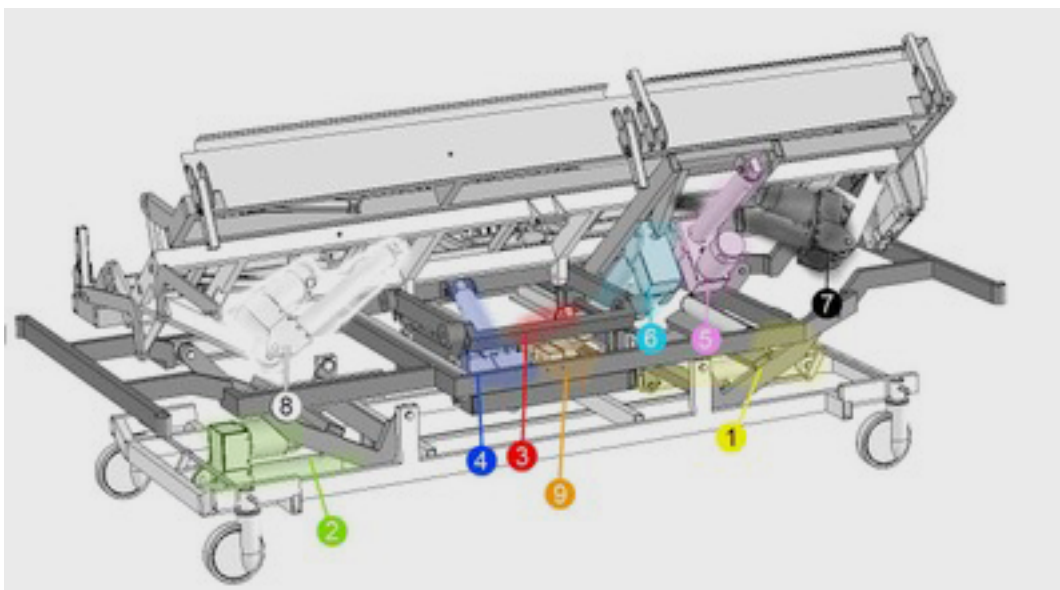


Figure 1- A 3D model of the mechanical EPOSbed prototype

As part of the **EPOSbed™** system, we have developed an innovative bed frame (see Figure 1); able to do the required movements in a hospital environment. The bed, designed using CAD and cutting-edge simulation techniques, is composed of a hospital bed frame moved by intelligent servo-actuators. Either using the intelligent software or the remote controller, the bed is able to do the following movements:

- **Lateral movement.** Lateral movement allows the patient to rotate left and right along the main axis of the bed. Lateral movement may be requested by patients desiring to change their position or may be scheduled by caregivers on a periodic basis (i.e. at night). Lateral movement is also useful when cleaning a patient. Due to safety reasons, the maximum rotation angle is restricted to 60°. The system automatically folds the lateral panels when in a step angle to avoid falling of the patient. Lateral movement is an innovation in hospital beds, since few products offer this kind of movement and none of them has available intelligent movement detectors; such as **EPOSbed™** does.

- **Fowler movement.** This movement allows to control together a sitting position with a leg and foot movement. A locking hinge allows the lower section to lift. This is probably the movement more demanded by patients since it allows them to incorporate at different positions.

- **Tredelenburg.** This movement is basically designed to improve blood circulation in patients. Again the movement can be demanded by patients or caregivers indistinctly.

An important element of the **EPOSbed™** system is the pressure mat sensor. The mat, composed of around 1.000 individual sensors, is embedded into the bed mattress. It is passive (i.e. has no electronics), flexible, washable and very robust. A patient laid on the bed exerts a pressure on each sensor. The information from the pressure mat is transformed into a pressure image. The intelligent software analyses in real time the pressure pattern and decide the most convenient intention to move. The software then commands the servo actuators and moves the bed to the desired position.

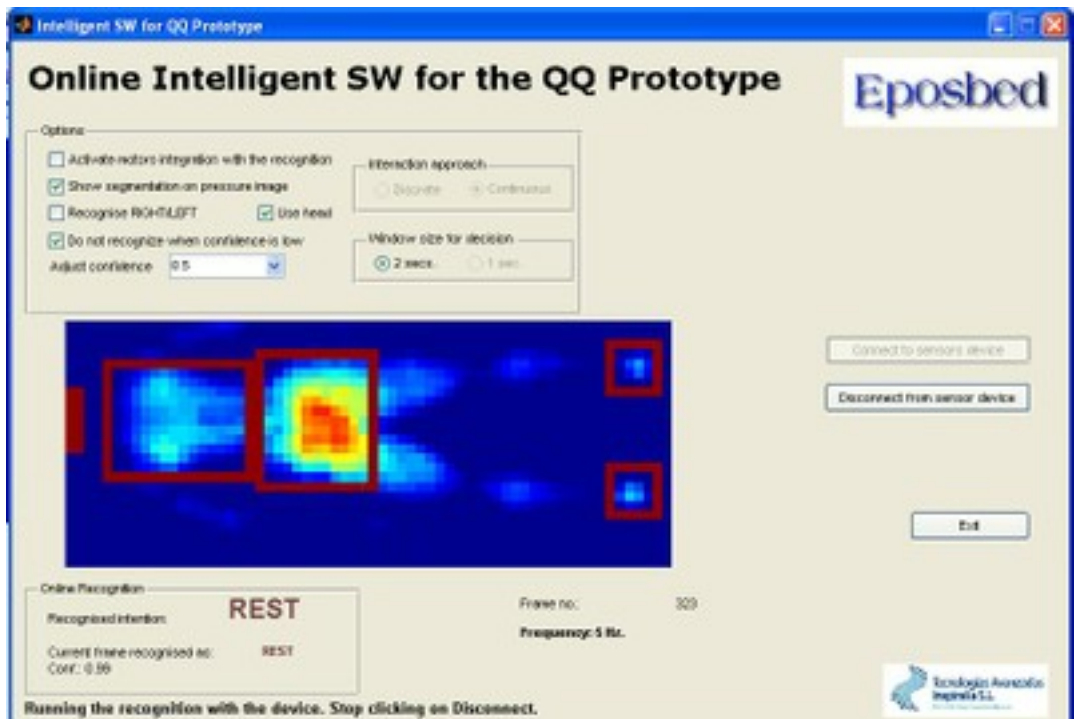


Figure 3 - A patient using the final prototype of the EPOSbed system