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Innovations for Quality in Life

The Smart Solution for all Medical Bags

SmartBagEco uses flexible sensors to measure the fill level of medical fluid bags. As the first solution developed for this application, it combines an advanced measurement principle with user-friendly design, making it accessible to everyone. This ease of use supports nursing tasks and enhances patient care. The system is compatible with all types of fluid bags, such as stoma, infusion and urine bags, making it versatile across applications in hospitals, outpatient care, and even private use at home.

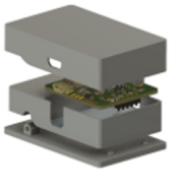
SmartBag Ecosystems

- Compatible with **all medical fluid bags.**
- **Scalable** fill level monitoring.
- **Personal** and **professional** use.
- **Continuous** fill level measurement.

Our Ecosystem

Our Ecosystem essentially consists of three components: *the Sensor, the Clip-On Module* and *App.* Designed for usage with all medical Bags. **Made for Carers, Patients** and **Family Members.**

The Sensor measures the fill level and simply needs to be attached to the medical fluid bag via an adhesive patch. Our sensor is fabricated by the use of **screen printing**, making it a time and cost efficient way of produce. It is also integrated within an adhesive bond patch for easy handling. It just needs to be attached to the medical bag currently in use.
hygiene focused single use item



The Clip-On Module features a 3D-printed casing that houses the electronics and incorporates a spring mechanism for secure and stable contact with the sensor. This design ensures reliable data transfer and includes alignment points for easy handling and accurate placement, simplifying setup for the user.
reusable item

The App offers customizable settings, allowing users to *adjust bag type, volume, and fill level thresholds.* Its intuitive design features large icons and simple navigation for ease of use. Built with **Flutter,** the app is *cross-platform ready,* ensuring adaptability on iOS, Android, and Windows. Utilizing **Bluetooth Low Energy (BLE),** it provides reliable, battery-friendly communication with the sensor.
digital companion

Bluetooth Low Energy

Value for all Stakeholders

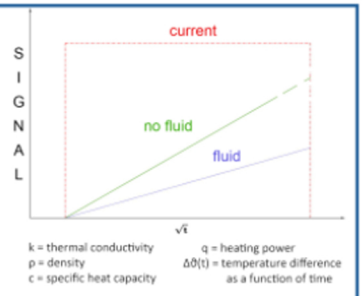
- **Doctors** – Gain accurate, real-time data for better patient assessments.
- **Health Insurance Providers** – Benefit from cost savings through more efficient care.
- **Patients** – Gain autonomy and assurance with easy, at-home monitoring.
- **Carers** – Experience reduced workload with simplified monitoring tasks.
- **Nursing Homes** – Support staff with easier fluid level checks and increase resident comfort.
- **Family Members** – Stay informed and feel reassured about loved ones' care.
- **Hospitals** – Improve efficiency and patient care with streamlined processes.
- **Care Facilities** – Optimize resources and enhance resident care.
- **Medical Bag Producers** – Add value to their product range with integrated sensor compatibility.

Measurement with effusivity

We measure the fill level based on **effusivity (e),** which is defined as:

$$e = \sqrt{k \cdot \rho \cdot c}$$

using the relation $$\Delta\vartheta(t) = \frac{2q}{e\sqrt{\pi}}\sqrt{t}$$



Learn more about our SmartBagEco. Scan the **QR Code** below or use our **NFC tag.**

Hochschule Kaiserslautern University of Applied Sciences

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