

## Digital Microfluidics – Flexibility for micro liquid handling

*Bringing novel technologies into medical applications, the microEngineering division from Bartels Mikrotechnik offers development support and product innovation through microtechnology. At this years' ComPaMED exhibition the company presents digital microfluidics as a method for fluid transport with high potential in diagnostic applications.*

Portable point-of-care testing systems are based on the secure handling of micro to nanoliter reaction volumes and parallel sample processing. In digital microfluidics small droplets can be flexibly manipulated electrically under software control to perform even the most complex liquid handling routines. Highly complex microfluidic systems can be designed in a compact, easy to use and highly flexible manner. Valves, pumps or microstructured surfaces are not required when this unique technology is applied.

The phenomenon behind 'digital microfluidics' is electrowetting. The wetting behavior of a droplet in contact with an insulated electrode is altered when an electrical field is applied. If the electrical field is applied non-uniformly a surface energy gradient is created which can be used to manipulate – transport – a droplet. The droplet can be moved from one electrode position with frequencies up to 200 Hz. Depending on the electrode design this allows free movement of a droplet under full control. Even a number of droplets can be controlled independently or in parallel. Next to pure transportation routines merging, mixing and splitting of droplets as well as droplet generation is possible. Therefore the routines required in lab-on-a-chip operation can be realized highly flexible. It is even possible to configure assay routines according to the needs via programmable electrode control. The direct control of fluid operations offered by digital microfluidics is a key driver for the future development of microfluidic diagnostic systems.

At the fair digital microfluidics demonstrators of liquid transport developed for display technology will be presented by Bartels Mikrotechnik. The company offers development services to customers from the analytics and diagnostics market. First ideas can be discussed with our creative heads directly at the fair.



Electrowetting: A droplet is moved from one position to another when voltage is applied.



Example of a microfluidic display



#### About Bartels Mikrotechnik

Ever since its foundation in 1996 Bartels Mikrotechnik GmbH has been a synonym for great innovative power and microtechnological know-how.

Bartels specializes in innovative applications of micro systems technology (MST) in the branches of classical consumer goods, mechanical engineering and medical technology. Microfluidics, microactuation and micromechanics constitute the company's technological focus. The international activities of Bartels Mikrotechnik subdivide into two business segments: Bartels microEngineering and Bartels microComponents.

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