

Applying Tech: Portable Medical, Part I

How are you influencing portable medical devices?

Bob Stanton

Director of Technology, Omnetics Connector Corp.



Omnetics Connector Corporation is heavily involved in supplying OEM medical equipment manufacturers with micro- and nano-sized connectors used to help interface probes, sensors, and detectors with portable medical electronic products. Patients can wear the electronics and perform normal daily functions with ease because the cable and connector size and weight is very small, yet rugged enough to withstand wear and tear of daily use. The connectors are often molded into the cable or instruments as needed to fit comfortably and allow easy attachment. Miniature portable connectors are being used in cochlear hearing devices, anti-pain stimulators, portable eyewear, portable sensors worn on the epidermis, and even wristwatch-like devices worn by patients to monitor their sleep behavior. A key to fitting micro and nano connectors into the portable electronics solution is to design with standard miniature connectors and to then modify the shape and size using 3D modeling to match the patient and instrument needed. Medical OEM manufacturers often receive the solid-model design suggested and then suggest final changes before integrating it into the final portable product.

Colin McCracken

Director, Solution Architecture, American Portwell Technology Inc.



Our customers who manufacture portable ultrasound devices, patient monitors, and medical tablets increasingly want to incorporate the latest consumer-oriented handheld technologies into their devices. They ask for tiny processor modules that can drive a small LCD while being powered only by a lightweight battery, with x86 preferred over ARM due to the easier software development experience and the much longer chip vendor production lifecycles (embedded versus consumer).

At Portwell, we answered this challenge with a 2.75 x 2.75 in. Intel Atom E-series module that scales from E620 @ 600 MHz to E680 @ 1.6 GHz with 512 MB-2.0 GB RAM and good graphics to handle the full range of OEM requirements, while consuming only several Watts to 5.0 Watts. This is only half the power of consumer tablets based upon Intel Atom processors. It delivers better graphics than most ARM-based modules, and can run full Windows 7 while ARM processors have to wait a year for Windows 8, meanwhile fumbling with less rich operating systems.

The module plugs into a low-cost memory-style connector, takes +5.0 VDC power and provides standard x86 standard chipset buses and I/O to the carrier board to be optimized to the exact requirements of the portable medical device. The PQ7-M105IT module delivers fast time-to-market and time-to-revenue and meets the requirements expressed by our medical customers.

Tom Chill

Marketing Manager/Systems Engineer, Plasma Etch Inc.



The use of Plasma Etchers has an influence on portable medical devices by increasing bond strength by 50 times for devices that require bonding of dissimilar

materials in many medical device applications. First, it is necessary to make the surfaces wettable. Our surface treatment enables this prior to the adhesive bonding process. We are able to do this by mostly using Argon and/or oxygen, which ensures hydrophilicity.

Danielle Collins

Field Segment Manager, Microfluidics, Bürkert Fluid Control Systems



There are four main drivers in the development and evolution of portable medical devices—miniaturization, reduced power consumption, higher reliability, and ease of use. Burkert is helping medical device companies address the first three of these requirements with its Twin Power line of rocker valves.

The Twin Power rocker valves incorporate a dual-solenoid design, which allows the use of a smaller valve with lower power consumption, without sacrificing performance. For example, replacing a traditional 16-mm valve with the Twin Power 10-mm valve reduces the footprint by 54% and energy consumption by 75%, while maintaining the same flow and pressure resistance of the 16-mm valve.

Because the Twin Power valves are based on the rocker principle of Burkert's Type 127 valve, performance and reliability are proven by over 20 years of experience in a wide range of medical and industrial applications.

With the ability to design and manufacture most fluid-control solutions in-house, Burkert often partners with manufacturers to provide not only valves, but complete custom manifolds to meet challenging footprint, material, and cost targets.

Ben Vanderhoof

Medical Segment Manager, North America, Portescap

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As the world becomes ever more mobile, so too does the need for medical devices that can keep pace.

Portescap is assisting medical device OEMs in this effort by providing motion solutions that are increasingly more efficient to improve battery life, compact to reduce package size, and provide greater output power for increased performance—all while maintaining the highest level of quality. Through the use of innovative design and materials, Portescap is able to bring motion solutions to life critical devices, such as respirators, insulin pumps, and surgical hand tools.

Innovations, such as our newly designed slot-less motor, which reduces thermal losses in respirators, providing increased efficiency and patient comfort, or the value-add solution of providing a multi-stage, off-set drive train system for an insulin pump that is the size of a pen cap, are a few examples of what Portescap is working on today.

Our ability to provide custom solutions to meet the evolving motion needs of the industry allows us to stay at the forefront of motor technology, and therefore, our customers at the forefront of their industry.

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