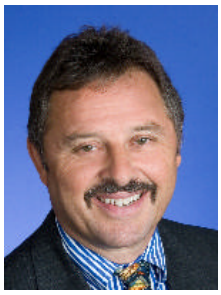
Applying Tech: Portable Medical—Part 3

How are you influencing Portable Medical Devices?

Alex Brisbourne
President and COO KORE Telematics



At KORE Telematics, we are increasingly helping organizations understand the critical role that reliable and ubiquitous wireless communications can play in taking the ‘quality of life’ benefits of portable medical devices to the next level. With wireless medical devices, patients can conduct normal daily activities while being monitoring.

One excellent example is a device developed by MedApps, one of our partners. CHF patients discharged from the Meridian Health Ocean Medical Center in New Jersey are provided with a MedApps remote monitoring device, and diagnostics are reported back to a monitoring nurse via the KORE network. By implementing these portable medical devices, Ocean Medical Center aimed to help patients improve their progress at home in self-management of their condition, reducing re-admissions. The program has been successful,reporting decreased re-admission rates for CHF patients from 14.93% in January 2010 to 5.6% by July 2010 - only 6 monthsinto the program. The overall trend for re-admission rates from 2009 compared with 2010 created an impact of close to 12% in the reduction of re-admissions.

KORE is influencing and enabling companies such as MedApps to build wireless portable medical devices, creating new innovations that improve patient outcomes and drive new product designs and sales.

Joe Spinozzi
Chief Operations Officer, Cyth Systems, Inc.

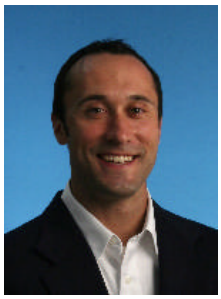
In order to design and test these devices a new paradigm fuels our methods for product development. For the control module, we vigorously seek the use of off-the-shelf electrical and software options to enable a rapid prototype in record time, and automated design validation tests to confirm the success of the project. Our goal with a small- to medium-sized device, with a successful concept demo and design plan, is to have a working prototype in as little as 15 days, but typically around one to two months. This leads to data gathering, validation of key requirements, and critical redesigns to move forward with the fabrication of pilot units and preparations for a satisfying result for investors, stakeholders, and eventually consumers

Tim Chismar
Biomedical Engineer for 3M Littmann Stethoscopes, 3M Health Care

Wireless communication is continually influencing the design of medical devices. The miniaturization of technology is allowing devices to be smaller and lighter while the computational capacity of the devices is increasing, allowing more functionality in a smaller footprint. Roughly 85% of physicians report they are using a smart phone/device, and by leveraging these available platforms, medical devices can be designed as a peripheral as opposed to a stand-alone unit. For instance, 3M Littmann Stethoscopes is developing a smart phone/device app that will allow multiple Bluetooth wireless 3M Littmann Stethoscopes to listen to the same sounds simultaneously. The wireless electronic stethoscopes are also enabled to clearly communicate across data networks in real-time from a remote location to a healthcare provider anywhere in the world using our 3M Littmann Scope-to-Scope Tele-Auscultation System. By establishing medical devices in the market place that are enabled to communicate to a remote location, a cost savings can be measured,

which will subsequently influence the payers to adopt the portable technology and allow healthcare providers to bill for that service.

David Niewolny
Medical Segment Manager, Freescale Semiconductor



Technology providers, like Freescale Semiconductor, are delivering breakthough products to portable medical device designers through advances in mixed-signal integration, display technology, connectivity and low power performance. Each of these items plays a key role in the portable medical space. Highly integrated mixed-signal microcontrollers allow devices to be more accurate while reducing cost, which is becoming an increasing concern as more devices are being sold Over-the-Counter (OTC) to consumers. This trend of consumer medical devices is also driving advances in display technology and connectivity. Consumers are looking for high resolution graphics that rotate along with the device and wireless connectivity. Our company offers microprocessors that have integrated graphics accelerators and stand alone devices for both sensing rotation and for wire free communication. Looking to the future, significant focus will be placed on enabling device manufacturers to eliminate batteries altogether. One of Freescale’s analog technologies, an ultra-low power DC to DC converter, enables IC startup thresholds to be reduced to 0.32 V and offers efficiencies of nearly 90%. This technology has the potential to enable devices that are powered solely by the human body, which would be a paradigm shift in medical device design.

Anthony J. Kalaijakis
Strategic Medical Marketing Manager, Molex Incorporated

Portable Medical devices (PMD) are driving the scale of interconnects to unprecedented micro sizes. There are several examples of PMDs that, a decade ago, were built only for use in hospitals or clinics. The miniaturization of these PMDs result in them now being portable and even wireless, making them efficient and convenient for patients to use at home.
As a result of the miniaturization and portability trend, the form factor of these PMDs is changing, with embedded electronics and interconnects having to perform better in less space. This trend continues in the microminiature connector market. Once only used in mobile phone and handheld electronic device applications,

microelectronics have now evolved into viable medical device solutions. One example in today's marketplace is the Molex SlimStack system, which is not only small – with a 0.40 mm (0.016") pitch and a low-profile height of 0.70 mm (0.028") – but also available in several configurations, depending on the device design.

A good example of how Molex is influencing PMD is the Molded Interconnect Design, which applies its 2-shot molding and Laser Direct Structuring plated plastic technology (consisting of molding, laser structuring and metallization) to dense medical application designs. Adapted from sculpting antennas for mobile applications, this technology makes it possible to incorporate the aforementioned SlimStack interconnect onto a three-dimensional housing with integrated traces. This approach significantly increases function and minimizes size while offering a three-dimensional approach to interconnectivity.