Significant challenges remain for miniaturization of devices

AJ Smith, Honeywell Sensing and Control

Device miniaturization is integral to the design and development of a wide range of medical devices, including analytical test equipment, ventilators, and infusion pumps. Making devices smaller and lighter helps conserve valuable real estate in patient rooms, enabling equipment to be placed closer to the patient as well as allowing more space for medical professionals to work. Increased portability for ventilators in particular has enabled medical teams to easily move the devices quickly from room to room as they are needed, instead of investing in a single large device for each bed. And finally, small, lightweight wearable medical devices give patients more freedom and mobility, facilitating a more normal lifestyle for treating chronic conditions, and a faster transition to recovery at home from acute treatments.

How does a manufacturer reduce size and weight of medical devices? One way is by developing sensors with a wide range of mechanical interfaces, mounting styles, and I/O options. This gives product designers the ability to choose the sensor package that most optimally fits within the overall product design. The right sensor can often reduce the size or need for other components. Another solution is to physically make the sensors smaller, which gives the design team a straightforward method for reducing size and weight. Sensor suppliers that are vertically integrated and control the design and manufacture of all components of the sensor including the sense elements, seals, housings, etc., are best able to optimize all sensor components for both performance and size. In addition, multiple sensors can be combined into one sensor package, reducing size and design-in complexity.

Another way sensors can help support the reduction of product size is by having more device intelligence incorporated inside the sensor module itself. Today, sensors can be fully calibrated, temperature compensated, and have high resolution digital outputs. These features facilitate a reduction of total electrical components on the board, thus reducing size, weight and cost.

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