



# IMPROVED HEALTHCARE MONITORING AND PATIENT SAFETY:

## Compliant Integrated Solutions for Durable Medical Devices

*Fully integrated Molex switch and interconnect cable assemblies deliver optimal design flexibility to support medical device manufacturers*

### BUSINESS CHALLENGE

Meeting healthcare needs is a priority worldwide. More than 50 million hospital-based procedures are performed annually in the U.S. – plus almost 130 million emergency department visits and over 100 million outpatient services. Global markets for medical devices are being driven by aging populations, increased surgical interventions, and rising demand for related diagnostic, surgical and monitoring devices.

Breakthrough technologies empower breakthrough medical devices that help improve the quality of life for millions of people. Dynamic growth in healthcare globally has made the job of medical device manufacturers more challenging. By adhering to quality systems manufacturers ensure their products meet the requirements of the U.S. Food and Drug Administration and other regulatory agencies worldwide that set standards for medical devices.

A medical device manufacturer requested Molex's support in redesigning a cable assembly for a bed mat sensor, as a design weakness in the existing product could potentially result in cable separation from the device. Hospital care frequently requires round-the-clock monitoring of vital signs and patient safety such as fall prevention. Bed sensor mats and other devices with lead wire sensors help healthcare providers respond in a timely manner. Monitors have evolved to become smaller, lighter weight and internetworked to improve safety and comfort.

### SOLUTION

Molex provided a replacement cable solution for the hospital bed mat. The cable assembly was redesigned and customized to effectively withstand patient movement – rolling over or tugging on bed clothing – and improve connector retention to prevent accidental disconnection. Molex was able to provide single-source accountability and traceability of all components, while delivering a more reliable design.

#### Molex Integrated Cable-Sensor Design: Benefits and ROI

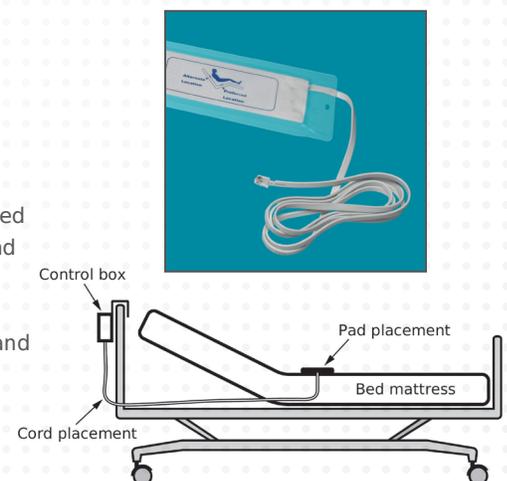
- Extensive medical device design and engineering support
- Expertise in materials, assembly and testing of medical assemblies
- Improved packaging with standard labeling and document controls
- Product performance, durability and reliability
- Experience designing for the healthcare environment
- Improved patient care and safety

From design to prototype to volume production, Molex supports medical device manufacturers in making better products for healthcare providers and their patients. Approved to work with medical device manufacturers in designing quality sensor, switch and cable assemblies, Molex understands what they need to meet compliance and exceed customer expectations.

The new bed mat assembly design uses a more robust manufacturing process to ensure a secure connection between the standard cable and connector. The entrapped cable delivers enhanced pull strength and ensures the cable won't separate or fray on the edges. The "entrapment design" provides the manufacturer confidence of a reliable connection, with reduced bulk for improved patient comfort. Sensor mat durability and comfort are important for patient care in hospital settings. The right design from Molex made the device more functional and reliable.

### Potential Applications for Molex Integrated Medical Solutions

- Patient monitoring and bed sensor mats
- Powered wheel chairs
- Heart rhythm management
- Diagnostic imaging
- Neurostimulation
- Diabetes control
- Hearing aids
- Infusion pumps
- And more





**Integrated product designs include range of Molex and Molex Affinity cable assemblies, encapsulated electronics, bulkhead connectors and ECG cables and lead-wire assemblies for successful medical device projects.**

• **Flexible Overmolded Cables Withstand Sterilization**

Silicone-jacketed MediSpec™ cable offers a durable, flexible assembly and protects the cable during use in healthcare environments. Overmolded assemblies are tested and validated to withstand multiple sterilization cycles by autoclave, STERIS\* and Sterrad† processes.

• **Encapsulate for Maximum Durability and Contaminant Resistance**

A unique proprietary capability for passive and active electronics, encapsulated PCBs offer durable, functional interconnect assemblies via overmolding or injection molded welded shells.

• **Brand and Safeguard with Custom Connectors**

Custom medical connectors can offer unique advantages. Rather than designing a device around a connector, connectors can be designed to match requirements. Custom connectors can provide shorter lead-times and branding opportunities for device manufacturers.

• **Optimize Patient Monitoring Performance and Comfort**

A wide range of ECG cables enable two to twelve leadwires for patient monitoring. Shielded or unshielded one-piece cables feature removable or permanently attached leadwires, with electrode snap connectors, pinch connectors or banana plugs.

• **Miniaturize Highly Complex Electronics**

Molded Interconnect Device/Laser Direct Structuring (MID/LDS) allows the integration of complex electrical and mechanical features into compact medical devices. Proprietary process blends a two-shot MID molding process with the speed and precision of LDS to create highly dense applications that meet required medical-grade guidelines.

\*STERIS is a registered trademark of STERIS Corporation

†STERRAD is a registered trademark of Advanced Sterilization Products Division of Ethicon, Inc.

To learn more [www.molex.com/ab/medicalmembrane1392.html](http://www.molex.com/ab/medicalmembrane1392.html)