

High Expectations for Robotically Assisted Surgical Devices

Do you have connectivity solutions to respond to the latest trends?

SITUATION

From neurologic and orthopedic surgery to colorectal and gynecologic procedures, robotically assisted surgical (RAS) applications are becoming more common. According to B2B market researcher, Markets and Markets, surgical robot sales will increase from US \$3.9 billion in 2018 to \$6.5 billion in 2023, a CAGR of 10.4%. Despite the broadening of applications and the increasing number of OEMs entering the market, one integral theme remains consistent: a profound need for fast and reliable data communication.

While other industries can go wireless with Bluetooth and Wi-Fi capabilities, persistent latency issues keep RAS devices grounded (literally and metaphorically) with cables. Additionally, the security risks associated with Wi-Fi and the reliability of hardwire are impossible to ignore. Because failure would mean the difference between successful and unsuccessful health outcomes, establishing secure and reliable high-speed data communication is crucial.

As a result, understanding the technology is of paramount importance and the first step to ensuring the efficacy of your future medical device.



TREND 1:

Adding Fiber Optics to Copper Connectivity

- As surgical robots gain functionality, data rates are pushed to their limits. Because these devices require more information to be sent in the same amount of time, designers need to either increase channel data rates or increase the number of channels.
- But more data at faster speeds creates issues with signal integrity. As a result, designers are turning to fiber optics. Copper cables can become bulky in devices that need to be accommodated in crowded operating rooms, while fiber optic cables are more compact. Also, because RAS devices need longer cables to enable mobility, fiber's better signal integrity (SI) though longer lengths is another advantage over Copper.

TREND 2:

When Life Is in the Balance, Low Latency Is Key

- Robotic devices often act as an extension of the surgeon's hands and need to respond instantaneously. Latency, however, would delay a surgeon's intended action, affecting precision and, ultimately, the procedure's outcome. Low latency, therefore, is an absolute must, but as data rates increase, this becomes more difficult to achieve.

TREND 3:

The Workaday Reality of Operating Rooms Mandates Durability

- The surgical theater is not a forgiving place; equipment failure here means a failed procedure. The dynamic, often crowded, operating room requires ruggedized, durable and reliable equipment. Cables are stepped on, rolled over and repeatedly exposed to wear and tear, but they must continue to function. These communication lines – the lifeline of the machine – need protection from rugged conditions to ensure the health of the system.

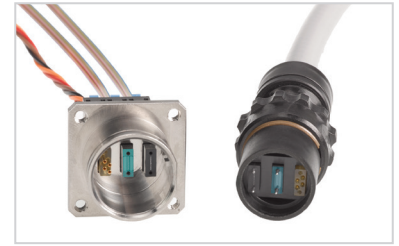
WHAT'S TRENDING

Molex MediSpec Hybrid Circular MT Cable Assemblies

MediSpec Hybrid Circular MT Cable Assemblies, custom designed to meet the specific needs of each application, deliver high-performance, mixed optical and electrical connectivity.

Molex provides a complete and reliable end-to-end cable solution that withstands the everyday challenges of today's surgical environments. Molex engineers leverage their technical expertise to build MediSpec Hybrid Cable Assemblies that satisfy the stringent requirements of surgical applications and enable customers to free up engineering resources for other aspects of surgical robot design.

SOLUTION: Fiber Optics and Copper in One Connector



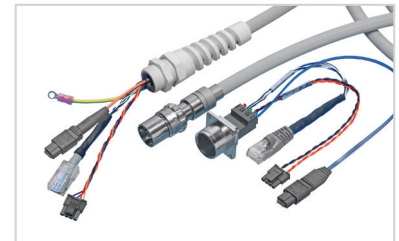
- MediSpec Hybrid MT Receptacles allow for flexibility in cable design and creation. Copper can be utilized alongside fiber for power or additional signal transportation.
- Both metal and medical-grade plastic housings offer design flexibility in for budget- and environmentally constrained applications

SOLUTION: Low Latency



- MediSpec Cable Assemblies and MT Receptacles deliver high data speeds that achieve ultra-low latency to enhance precision, making this an ideal solution for robotic surgery devices.

SOLUTION: Rugged Durability



- For applications that need to be repeatedly and easily plugged and unplugged, hybrid cable breakouts can include hyperboloid contacts that allow for high mating cycles and low-insertion/withdrawal forces.
- Along with optical MT and LC interfaces and hyperboloid contacts, hybrid cable assemblies can include Micro-Fit, MicroClasp and RJ45 connectors for board-level activity.
- Expanded beam technology ensures signal integrity despite any contaminants or scratches on the optical lens.
- Ruggedized fiber optic assemblies provide protection from daily wear and tear and insulation of fiber lines for cable assemblies of varying lengths.

Learn more about MediSpec Hybrid MT Cable Assemblies at www.molex.com/link/medispechybridcircular.html or [Contact Molex](#).

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