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## Guide to Winning Cable Assemblies

Industry-leading design support is key to meeting program requirements

*TTI has sponsored this post.*

Better ... Stronger ... Faster. While the phrase may have been popularized in the '70s by that campy science fiction TV series (“The Six Million Dollar Man,” for the non-Boomers), it



perfectly captures the mandate for the field of connectivity in the 21<sup>st</sup> century. As more industries prioritize connectivity to support modern technologies, the demand continues to grow for more quality, more power, and more speed.

The cable assembly market, which plays a vital role in advancing connectivity solutions across various industries, is evolving and experiencing substantial growth as a result.

The importance of seamless data transmission and robust global connectivity requires that businesses invest in upgrading their technological infrastructure. This necessitates the adoption of efficient cable assemblies that provide reliability and high performance.

Cable assemblies designed for high-speed data have become a focal point, driving innovations in cable design, materials, and manufacturing processes to meet the stringent requirements of modern communication systems. It's a crucial and transformative trend within the market.

### CABLE ASSEMBLY CHANNELS

With the transition toward more high-power products, having multiple channels from which to select the most appropriate cable assembly, as well as experienced design support in the process, is crucial, according to Scotti Holman, business development manager at Molex. There are three ways Molex supports customers in their program requirements for cable assemblies: Off the Shelf, Simple Design, and Design Solution.

#### Off the Shelf

The off-the-shelf (OTS) selection of designed, qualified cable assemblies provides a wide range of choices with a broad offering of connectors and cable lengths to facilitate both prototyping and global production. This is often a good place to start since these cable assemblies are in stock with various distribution partners like TTI, noted Holman. “By providing a completed assembly that meets the IPC-specification design, an OTS cable solution saves on tooling costs, expedites development cycles, and adds convenience to the purchasing process.”

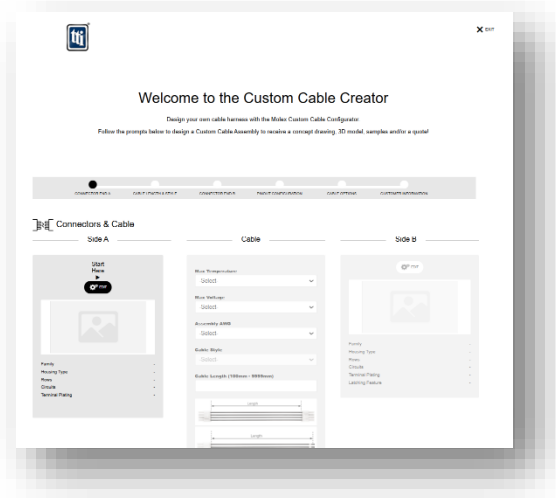
These cable assemblies have three design types to offer the most flexible prototyping and preproduction options: pre-crimped leads, discrete cable, and overmolded cable. They are used in numerous applications ranging from consumer mobile and hand-held devices, furniture with integrated electronics, to ATMs, vending machines, and office equipment. Commercial applications include drones, agricultural equipment, and automotive infotainment systems.

*Off-the-shelf cable assemblies are used in consumer and commercial applications.*

## Simple Design

Off-the-shelf products can also be modified to meet precise specifications. Through its Simple Design Support Team, Molex allows customers to add customization to cable assemblies to build the exact lengths, connectors, and components, as well as to configure custom pin-outs. Its user-friendly online [Cable Assembly Design Guide](#) helps to expedite development by assisting cable assembly designers in selecting readily available components (when possible) to minimize sample, preproduction, and production lead times.

The guide provides insights between cost and performance trade-offs for the most common decisions faced by cable assembly designers in the consumer and commercial markets. And a cable support team helps take the design from prototype to production, reducing mass production costs.



An electronic version of the guide, the [Custom Cable Creator](#), serves as an “excellent springboard for engineers to get their designs off the ground,” said Holman. The Custom Cable Creator can provide a concept drawing and 3D model in one day, a distributor quote in 1-2 days, and a sample in 7-10 days.

*The Molex Custom Cable Creator helps to expedite the design phase and overall process for production of cable assemblies.*

“This tool enables them to have prototypes in hand quickly and move forward with the design build,” she added, “getting them from idea, to production, to market much, much faster.”

## Design Solution

The Molex front end technical team provides in-person assistance and expertise with the sample, prototype, and design, while also providing support with concept development, custom tooling, and modeling for cable design. Team members are available locally, regionally, and globally to physically go look at applications and advise and offer technical support.

With a global footprint – manufacturing facilities in Asia, India, and Mexico, along with full design and engineering teams – as well as a presence in North America and 38 countries worldwide, Molex is positioned to assist customers no matter where they're located or where they are assembling their end product.

With a global manufacturing footprint? Molex offers engineering design support worldwide;

## THE VALUE OF KNOWLEDGE + PARTNERSHIP

Collaborating with a knowledgeable partner establishes



an efficient path forward for creating the right cable assemblies. As a connector manufacturer, Holman said Molex brings first-hand connector engineering and crimping knowledge to the cable assembly process, which provides a “significant” advantage.

*High-power Application*

“Anywhere there’s a connector involved, there’s a cable,” said Holman, who noted that cable assemblies often tend to be an afterthought. When choosing connectors, it’s important to consider the cable assembly, she said, especially given that wire has such long lead times, which can slow everything down. Molex can help circumvent that potential problem and support its customers in a timely manner to keep their projects on schedule.

“We also vertically integrate the supply chain,” she said, “which means we can find the absolute best components at the absolute best price.”

In addition to industry-leading quality and global engineering support, Molex also has manufacturing capability redundancies. “If we can manufacture something in one plant, we can do it in all three,” she explained, adding that all the facilities are UL certified:-

## What Does Good Look Like?

A truly good experience begins at the beginning – at the design stage of a new project. And this starts with the quoting process.

“We work together to make sure we have all the necessary information to quote effectively on the first attempt,” Holman said. “Ideally, we want to help influence the spec by offering

the best solutions for each step.” She said this requires a full understanding of the project, which means asking lots of questions.

To be clear on the scope of the project, regarding everything from the EAU and prototype volumes to delivery and packaging requirements, is what ultimately allows for a strategic business partnership that leads to success, she explained. “The bottom line is that we are in it for the long haul.”

Holman said this may lead to Molex making suggestions along the way, especially in the relatively new high-power area, which is expected to continue growing exponentially.

## HIGH POWER IS IN HIGH DEMAND

The demand for high-power cable assemblies reflects the continual evolution and massive influence of The Internet of Things (IoT), cloud computing, and 5G wireless, all of which require ever-greater data speeds and bandwidth. Data centers serve as the hub of the internet, providing the infrastructure and services that enable businesses and individuals to communicate, store, and access data.



*Data centers require ever-greater power and speed.*

The immense amount of power required to operate data centers requires immensely powerful components that must also meet stringent requirements. Power supplies and their connectors must deliver more power per inch of rack space; they must provide a flow of power that’s free from surges and spikes, while providing a short-term emergency supply in case of power outages; and they must be thermally managed to reduce heat that can affect the signal integrity.

“Our high-power cable assemblies are supporting the rapid growth of the data center market,” said Holman, “and ultrasonic welding capability is in place, with capacity expansion underway.”

Molex now supports off-the-shelf, as well as custom products, in [high power](#). Along with legacy Fit Family, Sabre, and Guardian, Holman points to the [UltraWize](#), [PowerWize](#), [SW1](#), and [PowerPlane](#) products.



“[UltraWize](#) power connectors and cable assemblies are specifically engineered for demanding data center applications,” said Holman, “to provide reliable, robust, and space-saving power distribution in these environments.”

*UltraWize Cable*

The UltraWize products use proven Coeur socket technology, which

incorporates conical sockets to ensure a large conductive surface area. This reduces contact resistance and voltage drop to minimize heat generation and deliver high-current carrying capacity. And the cable-side exit configuration uses minimal space, enhancing efficiency and design flexibility.



-Coeur Socket Technology

### Adding a Key Market

Throughout its 80-year history, Molex has been involved in numerous markets, including the appliance, automotive, consumer, medical, and industrial spaces. The company is responding to the “Better, Stronger, Faster” connectivity mandate with the addition of high-power to its key markets, supporting the heavier gauge wire needed for those applications.

Holman said Molex works hand in hand with its distributors to accomplish shared success. “The strong relationship with our partners at TTI enables us to deliver what I would call ‘integrated solutions.’ By collaborating closely with the TTI Sales Team and FAEs, we efficiently stock components and work to secure contracted pricing, ensuring the best products and services for our customers.”

To learn more about Molex high-power connectors and cable assemblies, visit [Molex at TTI](#).

