CHANGING AND CROSSING CABLE ASSEMBLY CONNECTORS

By Epec Engineered Technologies

Cable assembly technology is far more mature today than it was even five years ago. There are thousands of different types of connectors currently available so it is critical to partner with a manufacturer that can navigate through all of the complexities involved in changing and crossing cable assembly connectors.

The assembly manufacturer needs to understand all aspects of the finished product and how it will be used in order to choose a connector that will perform in the application as expected. Think of all of the types of applications such as data communication, telecomm, video and audio transmission, medical environments, as well as industrial applications which all carry unique characteristics. Applications may need to have sealed connectors if they will be exposed to moisture or particulates. There could be a need for locking connectors if there is exposure to vibration or shock, and the list goes on and on. There are a lot of steps and considerations when dealing with cable assembly connectors.

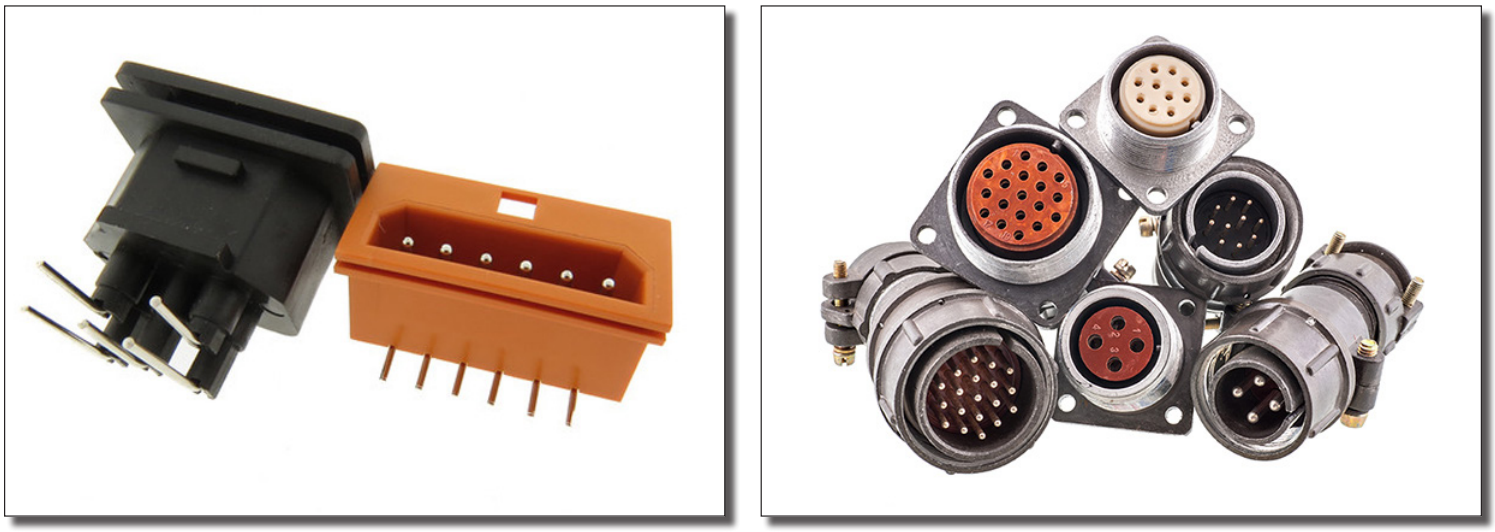

Figure 1. Various commercial off-the-shelf cable connectors.

Exact Form, Fit, and Function

A number of reasons may cause the need to change or cross a cable assembly connector. These reasons could include the lack of availability, pricing, delivery, and ease of installation issues. It could even come down to personal preference, a connector just doesn't feel or look right.

When you need to cross over a connector, the main point is you have to make sure that the footprint of the connector is identical to what is currently being used.

In most instances, the footprint of the connectors on the assemblies we produce are already established - meaning we are aware of where the connector is going and what it will be exposed to during its expected life cycle. Everything needs to be exact to the original footprint, the center spacing and arrangement of the contacts/terminals and even the transmission characteristics are all areas that need to be addressed.

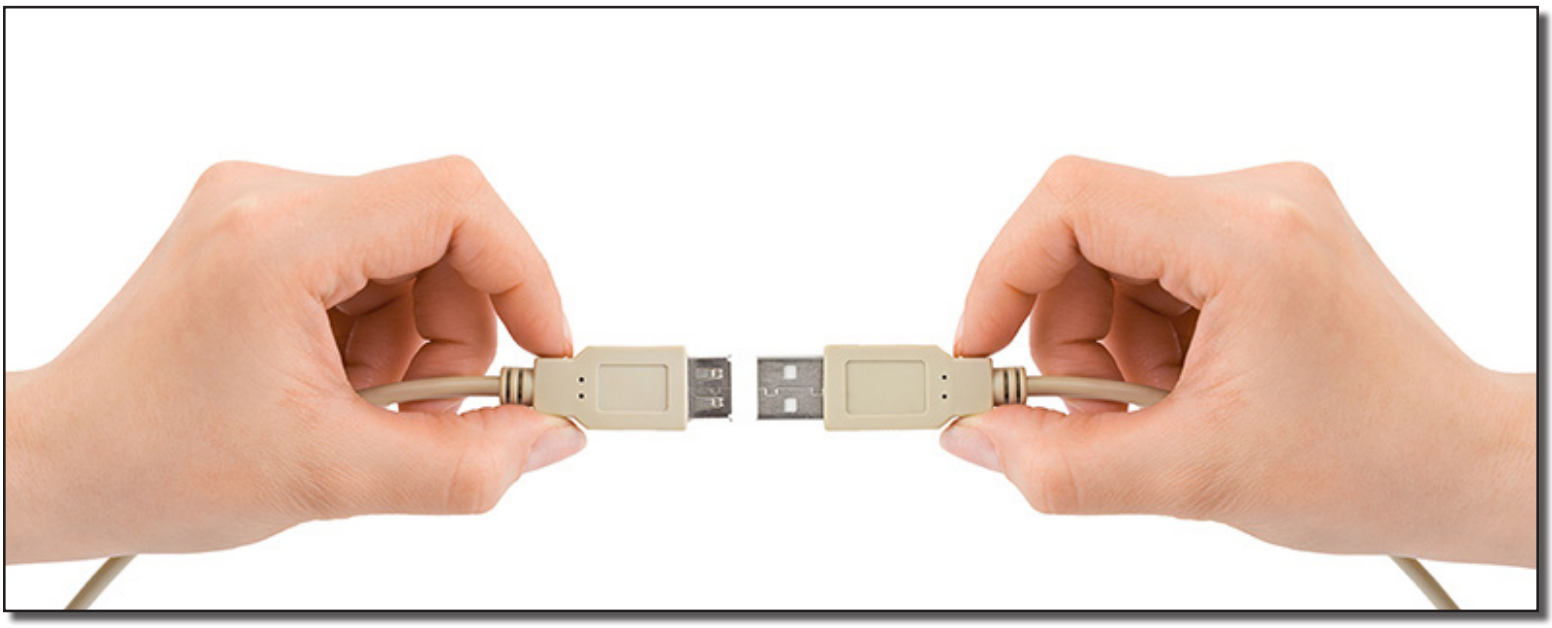

Figure 2. Verify the form, fit, and function when crossing the most common connectors such as a USB.

You cannot take a DVI cable and hook it up to a RJ45 and expect it to work. The exact form, fit, and function is the ultimately goal.

Proceed With Caution

You do need to proceed with caution when approaching a new cable assembly manufacturer. There are several instances in which manufacturers may lean away from best practices concerning the form, fit, and function of the connector if it means they will be able to meet the price point.

An example would be a manufacturer eliminating a strain relief on an IDC connector in order to save a few pennies. This could potentially cause a premature failure if the strain relief was a crucial part of how the assembly is used.

In order to be successful you need to ensure that the form, fit, and function is maintained. The cable assembly connector needs to perform in the way it is intended. For instance, if an assembly is to be used in an area with the potential for high EMI/RFI exposure, the assembly needs to be properly shielded from end to end. This would include ensuring that the shields are applied in a manner to minimize any signal leakage and that the shields were terminated correctly at the connectors.

Addressing the Environment

An important aspect to ensure a smooth transition when crossing a connector is to be as specific as possible in the applications use and in which environment the application will be used.

Is this an application that will be splashed with water, are you using a medical cable assembly which will be put through one of the many sterilization techniques, or is your assembly going to be used mainly outdoors?

Figure 3. Cables used in an application with exposure to water and moisture.

For instance, if it is known that a cable assembly connector is going to be used as a connection on a tractor trailer truck, it is likely that the connector will be exposed to rain, sand, snow, shock/vibration, temperature extremes, and anything else that could be experience as the truck is going down the road. With that amount of information a determination can be made to choose a connector that can withstand those types of extremes.

Another determination used in choosing a connector is the human element of an installation. Are the ultimate users of the assembly well trained and understand the nuances needed when connecting and disconnecting the assembly? In some instance the answer is likely not. A manufacturer can control how the assembly is built but cannot control the user so the manufacturer must build the assembly to withstand unexpected encounters. The right information provided to the manufacturer allows for a connector to be chosen that can withstand the conditions the assembly will be exposed to and to be able to exceed the requirements of the application.

Time Expectations

Determining the length of time for completion of an assembly build will vary depending on what the customer would like to accomplish and what materials are readily available. If there are exotic parts or long lead times for components of the assembly, then the production timeline can be weeks, a month, or more to completely resolve the cross/change of the connectors. If the assembly uses commercial off-the-shelf the timeline would be significantly different.

Summary

From a customer standpoint it is crucial to work with a reputable manufacturer that can assist you from design to production. There are many suppliers in existence today that just want to consistently bring work in and get work out as quickly as possible. Expediency is a necessity in today's world but moving too quickly can open up opportunities for failed builds.

An assembly may be very attractive from a price standpoint, but in the end application the assembly may not work properly causing premature failure and increased cost of ownership. Many manufacturers may lack the technical expertise and do not stand behind their work. Epec's philosophy is to build a product that is going to work in the intended application in such a way that meets and exceeds the customers' expectations – we are determined to build it right the first time!