Cable Assembly Polarity Guide

In its simplest form, fiber polarity is the direction data/a light pulse takes from traveling through a cable, point A to point B. For polarity to be maintained and, thereby the connection between the devices achieved, a fiber optic link's transmit signal (Tx) at the end of the cable must match the corresponding receiver (Rx) at the other end.

It is important to note that the TIA-568-D standard outlines two types of fiber links: serial duplex signal connections and parallel signal (MPO/MPT) connections.

FULL-DUPLEX ASSEMBLY POLARITY MAINTENANCE

Two types of duplex fiber patch cords are defined in the TIA standards: **A-to-A type** (cross-over) shown in Example D and **A-to-B** (straight-through) shown in Example E.

Example D

Note: *A-to-A patch cords are not commonly deployed and should be used only, when necessary, as part of a polarity method*

To help network operators and installers maintain proper channel-wide polarity, TIA standards recommend the A-B polarity scenario for duplex patch cords. This straight-through connection maintains the A-B polarity in a duplex channel (Example E).

Example E

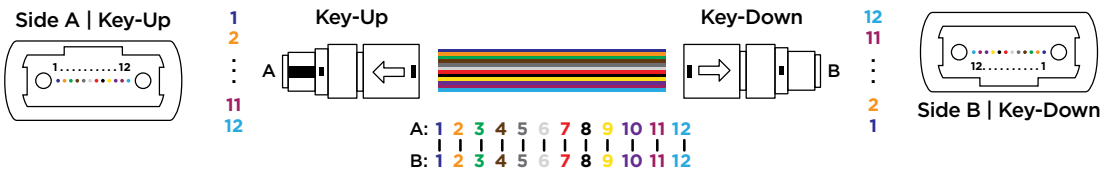
Note: *Every fiber connector is keyed to prevent fiber rotation during connector-mating guaranteeing the correct Tx and Rx connection.*

MPO/MPT ASSEMBLY POLARITY MAINTENANCE

The TIA has defined three different polarity methods to maintain fiber polarity when using multi-fiber MPO/MTP array patch cords. Each method uses different types of MPO cables: Type A, B, and C are used for the three different connectivity Methods, A, B, and C, respectively. With three different polarity methods and different patch cords for each, mistakes are common.

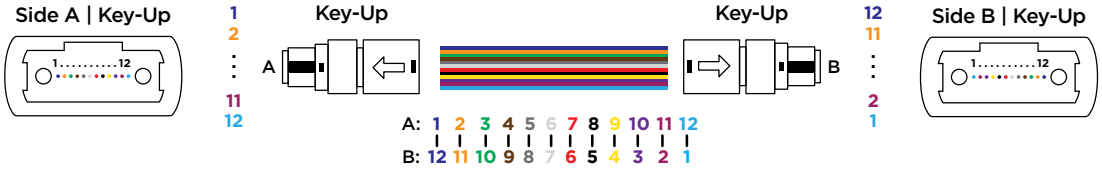
Method A

Method A uses **Type A** (straight-through) MPO cables with a key-up connector on one end and a key-down connector on the other end so that the fiber located in Position 1 (Tx) arrives at Position 1 (Tx) at the other end.



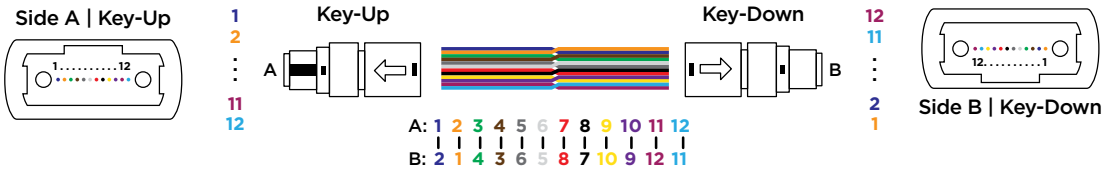
Method B

Method B uses key-up connectors on both ends to achieve the transceiver-receiver flip so that the fiber located in Position 1 (Tx) arrives at Position 12 (Rx) at the opposite end, the fiber located in Position 2 (Rx) arrives at Position 11 (Tx) at the opposite end, and so on.



Method C

Like Method A, Method C uses a key-up connector on one end and a key-down connector on the other end. However, the flip happens within the cable itself, where each pair of fibers is flipped so that the fiber in Position 1 (Tx) arrives at Position 2 (Rx) at the opposite end, and the fiber in Position 2 (Rx) arrives at Position 1 (Tx).



SEL Cable Assemblies

Sumitomo Electric Lightwave (SEL), an industry leader in fiber, cabling techniques, and connectorization, has one of the widest selections of cable assemblies: patch-cords, jumpers, rip-cords, trunks, and interconnects of any industry-leading fiber optic solutions provider to include the often-illusive exact length cable assemblies.