

CHOOSING FIBER OPTIC CONNECTORS

Choosing the correct type of fiber optic connector comes down to three main questions:

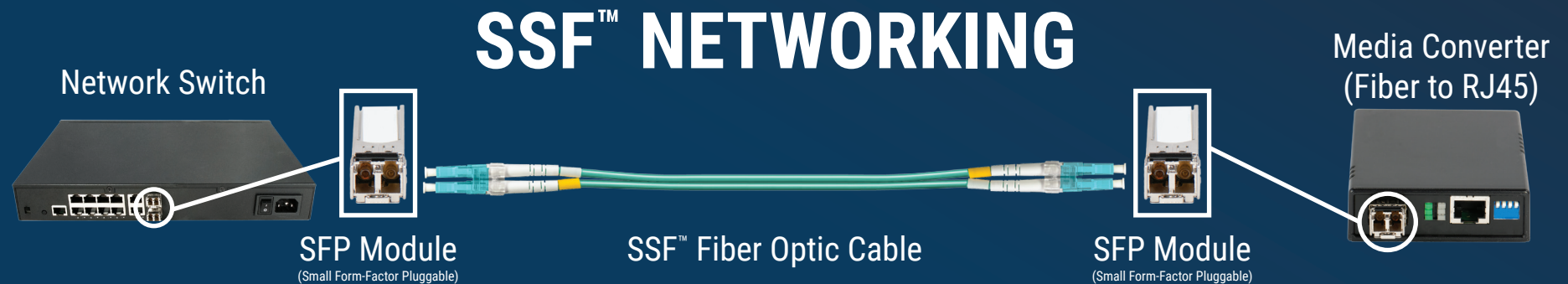
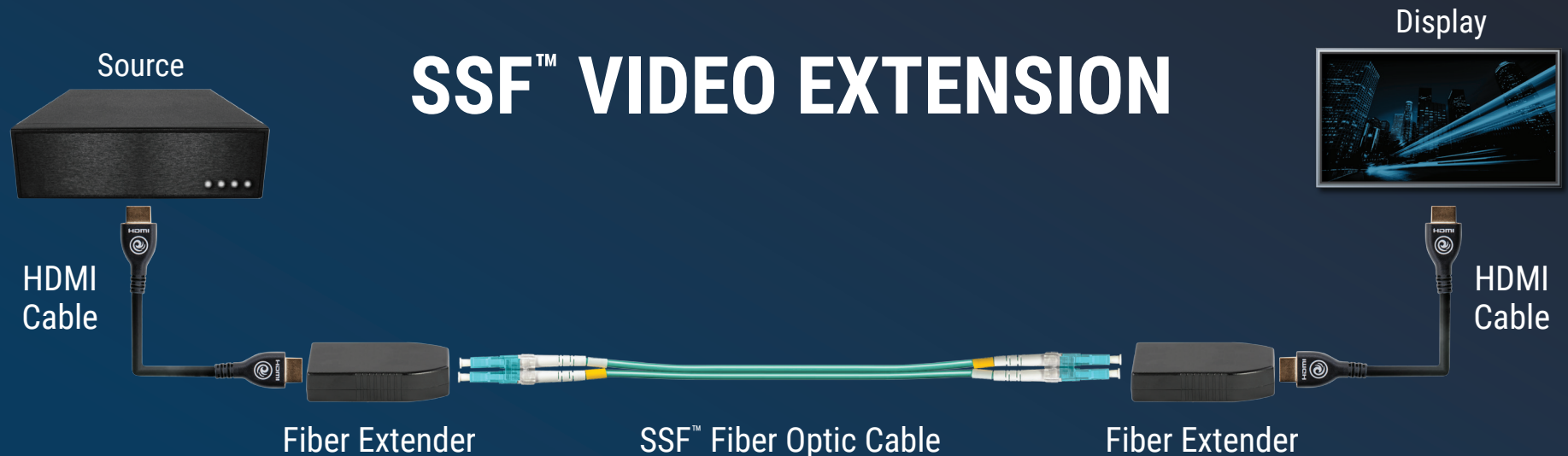
1. What connector type does the equipment being installed require?
2. What fiber type is needed?
3. Are there any requirements for polish type?

This guide discusses common connectors for fiber optic networking and audio/video applications. For questions on other connector types and configurations, please contact us at info@clrtec.com.

Cleerline manufactures easily installable LC and SC mechanical splice connectors. For more information on available connector types, visit cleerlinefiber.com/product/connectors or see the last page of this booklet.

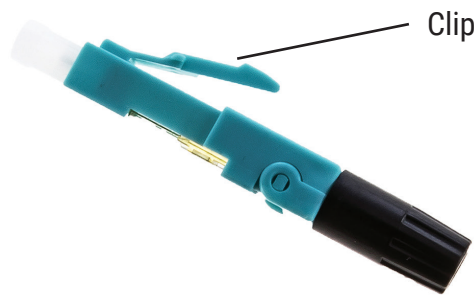
CONNECTORS IN NETWORKS

The equipment in use dictates the connector type. In these examples, the fiber extenders and SFP modules require LC connectors, but this varies by device. The LC connectors, identifiable by their small size and distinctive clips, are at either end of the pictured SSF™ fiber optic cable.



COMMON CONNECTORS

There are many types of fiber optic connectors, including LC, SC, ST, FC, MPO, MTRJ and more. Within the United States, three of the most popular styles for networking and A/V are LC, SC, and ST connectors.



LC CONNECTOR

LC (Lucent) connectors were developed by Lucent Technologies, Inc. Each connector has a 1.25 mm ferrule, half the size of an SC or ST connector's 2.5 mm ferrule.

Today, LC connectors are a very common choice for networking and high-density installations due to their small size.

SFP (Small Form-Factor Pluggable) modules and fiber optic extenders also often use LC connectors, although this varies by manufacturer.

LC connectors can be distinguished by their small size and clip design.

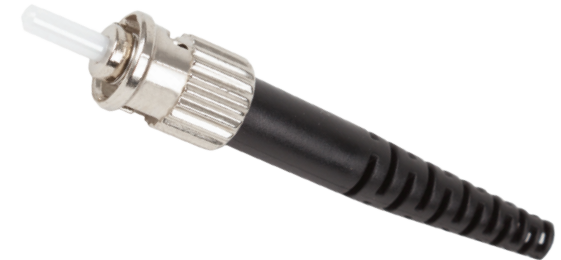


SC CONNECTOR

SC connectors were the first connector chosen for the TIA-568 standard and are still in frequent use today. Each connector has a 2.5 mm ferrule.

They are a snap-in connector and latch with a simple push-pull motion.

SC connectors are used with select styles of fiber optic extenders, although LC styles are more commonly used.



ST CONNECTOR

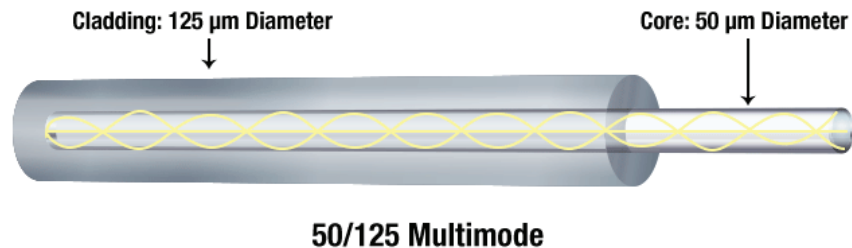
Like SC connectors, ST connectors have a 2.5 mm ferrule. ST connectors were designed by AT&T. Each connector features a bayonet mount with a long cylindrical ferrule.

Most ferrules are ceramic, but some may be metal or plastic.

ST connectors, while previously widely used, are less popular today.

SINGLE MODE vs. MULTIMODE

Fiber connectors are designed specifically for the type of fiber in use. Single mode fiber requires single mode connectors. Multimode fiber requires multimode connectors.



SINGLE MODE

Single mode fiber has a 9 micron (μm) core with a 125 μm cladding. A 9/125 notation indicates single mode. The core size is much smaller than that of a multimode fiber. To transfer signal correctly, single mode fibers require single mode connectors.

It is impossible to distinguish core size with the naked eye, so it is vital to ensure fiber type is known before choosing connectors.

MULTIMODE

Multimode fibers have either a 50 μm core with a 125 μm cladding (OM2/OM3/OM4) or a 62.5 μm core with a 125 μm cladding (OM1).

While generally connectors for OM2, OM3, and OM4 fibers are interchangeable, OM1 rated connectors cannot be used on OM2, OM3, or OM4. This is due to the difference in core size.

POLISH TYPE

Connectors can have differently polished endfaces. This impacts the connector's level of return loss. Polish type is particularly applicable to single mode connectors.



UPC (Ultra Physical Contact)

UPC connectors have the most common polish type. The endface is slightly domed. These connectors are used for common networking applications and are installed more frequently than APC connectors for A/V applications.

Single mode UPC connectors are color-coded blue.

APC (Angled Physical Contact)

APC Connectors have an 8° angle at the endface. This angle causes light to bounce toward the fiber's cladding, helping to decrease return loss.

However, APC connectors have very specific applications, such as GPON, FTTx, etc. They are only used when required by specific equipment. These connectors are most frequently used by service providers, or for long distance transmissions. APC connectors are colored green.

UPC and APC connectors cannot be mated due to the angle of the APC connector. The connector types are not interchangeable. Always verify the type of connector required. If a single mode connector is recommended and no polish is specified, utilize UPC connectors. If APC connectors are required, you must install APC connectors.

CONNECTOR COLOR CODES

Connectors are often color-coded for easy identification. The chart below shows this with LC connectors. Note color-coding varies by manufacturer, so be sure to double check. (For example, Cleerline SSF™ OM2/OM3/OM4 Duplex Patch Cables have beige connectors.)



OM1

Multimode 62.5/125

Beige*



OM2

Multimode 50/125

Black*



OM3/OM4

Multimode 50/125

Aqua



OS2 - UPC

Single Mode 9/125

Blue



OS2 - APC

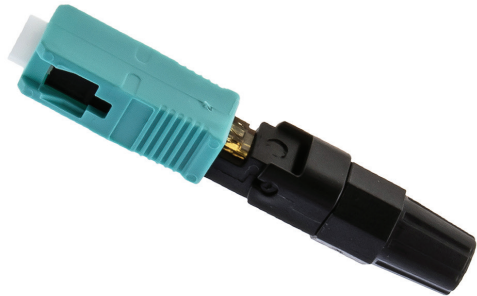
Single Mode 9/125

Green

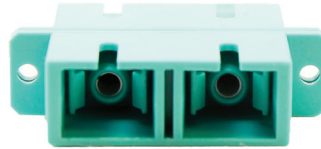
*Beige and Black may also apply to different grades of multimode - check jacket and print legend

CHANGING CONNECTORS

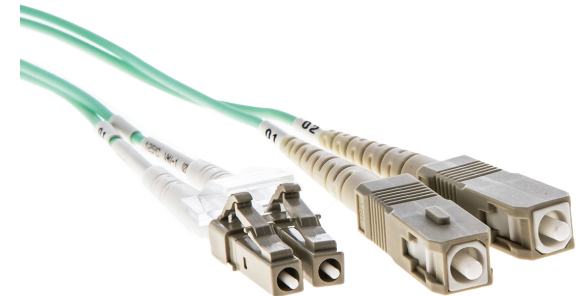
Install an SC connector and need an LC connector? No problem! Instead of re-terminating, use an SC-SC adapter with an SC-LC patch cable. (Just make sure your fiber type matches throughout!)



SC CONNECTOR



SC ADAPTER



SC-LC PATCH CABLE

+

+



Items similar to those above, such as LC adapters and different patch cables, can be used to convert to a wide variety of connector types.

In addition, hybrid adapters are available, such as the SC to LC adapter pictured (left).

Patch cables are available in many configurations, including SC-SC, SC-LC, and LC-LC. Simply ensure that your fiber type remains consistent throughout.

Learn more about available Cleerline SSF™ connectors and connectivity products at cleerlinefiber.com/products.

CLEERLINE SSF™ CONNECTORS

Cleerline SSF™ field-installable LC & SC connectors eliminate the need to hand polish, epoxy, or crimp in the field. Compatible with all SSF™ fibers as well as traditional fiber optic cabling.



SSf-LC-MMFPC-10

LC Multimode OM2/3/4 UPC, 10 Pack



SSf-LC-SMUPC-10

LC Single Mode UPC, 10 Pack



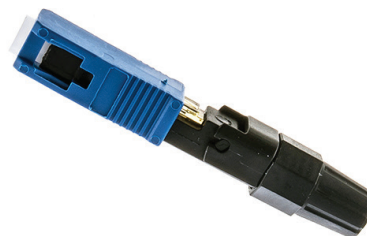
SSf-LC-SMAPC-10

LC Single Mode APC, 10 Pack



SSf-SC-MMFPC-10

SC Multimode OM2/3/4 UPC, 10 Pack



SSf-SC-SMUPC-10

SC Single Mode UPC, 10 Pack



SSf-SC-SMAPC-10

SC Single Mode APC, 10 Pack

**View all Cleerline SSF™ Connectivity Products at
cleerlinefiber.com/product-category/connectivity**