

- Optical FAQ -

Optical Connectors:

Connectors can vary slightly from vendor to vendor. How the fiber is terminated in the connector and how the angles are cut. All these variables and other differences can make significant differences in optical level. We generally purchase all our cables and even have Our Detectors and Lasers re-terminated by the same vendor so to keep everything consistent.

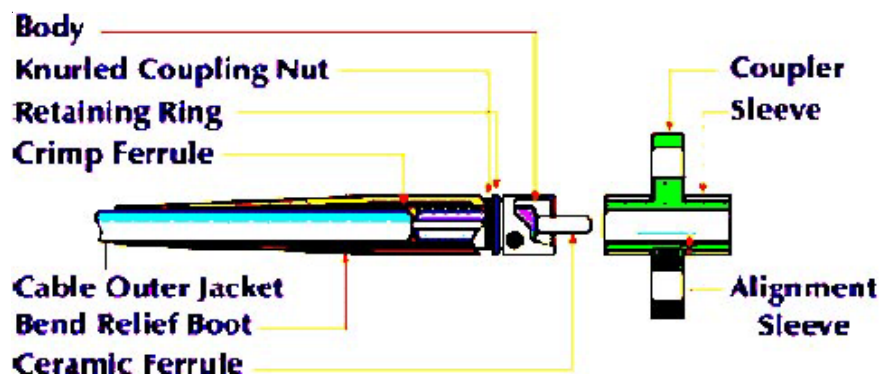


Figure 1 - Parts of a typical connector

Connector types:

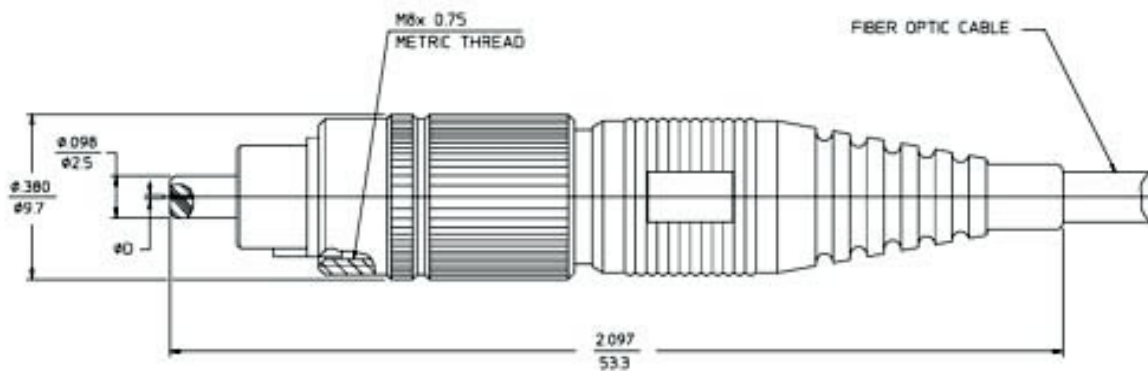


Figure 2

FC/PC:

The FC/PC connector is one of the most widely used connector in the Telecommunications industry.

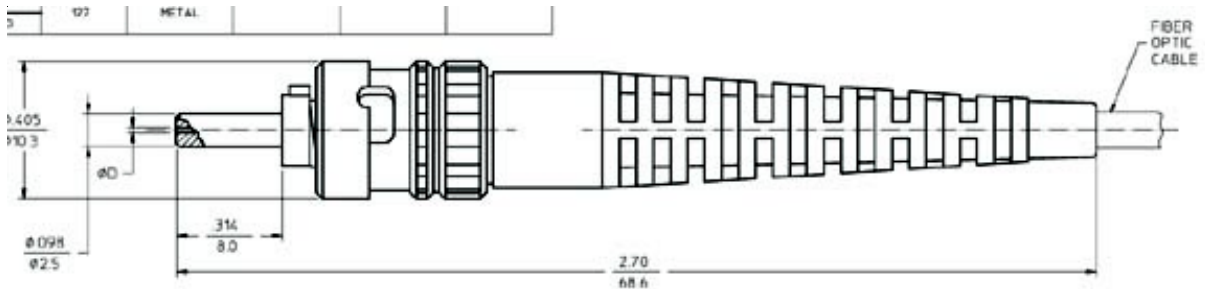


Figure 3

ST:

The ST is the most commonly used part in the Data Communication applications.

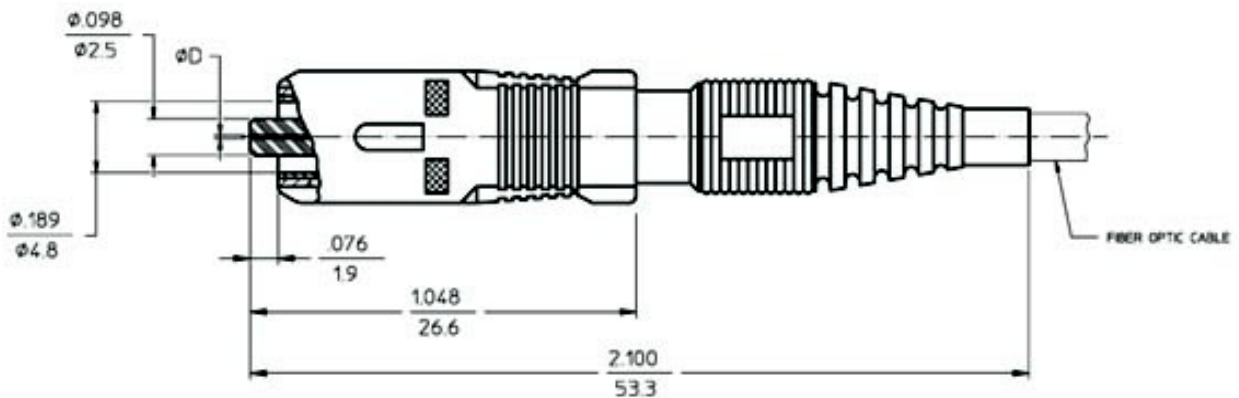
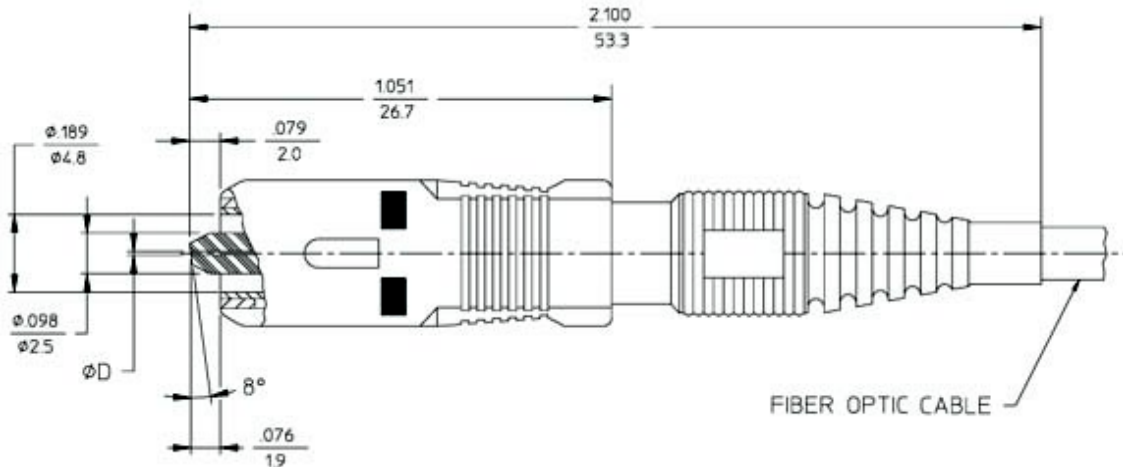


Figure 4

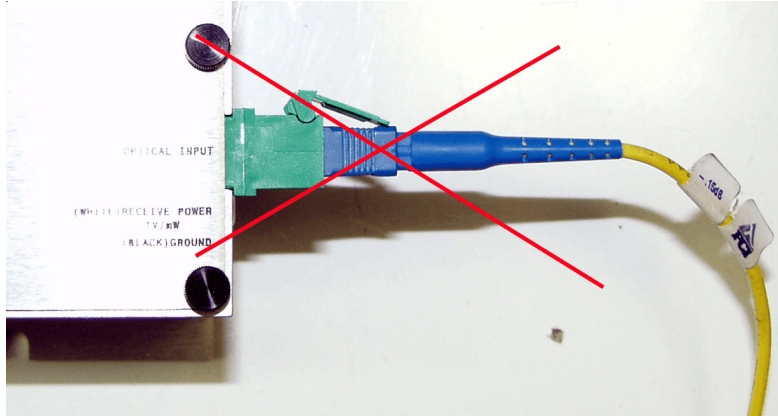
SC:

The SC connector is growing in popularity. Although the SC will fit perfectly into SC/APC connector they are not compatible with SC/APC due to different angles on the fiber, this causes many problems when systems are first set up. The SC is usually blue in



APC is usually green to help avoid this error

SC/APC:



The SC/APC connector is similar to the SC connector but offers lower back reflection due to the cut on the fiber. This connector is standard on Olson Technology products.

Just remember “SC and SC/APC don’t mix”

Connector care:

- Avoid touching the end of the fiber, oils and dirt will reduce optical power level.
- Even if the fiber is new always clean prior to connecting.
- Avoid sharp bends in the cable, this will increase attenuation.
- Never leave a connector unprotected, always keep a protective cap on or leave in a adapter.

Cleaning connectors: Cleaning connectors:

The single mode fiber is only 9 to 10 microns in size which means it doesn't take a very big particle of dust or debris start effecting signal level. Even if the connector is brand new, just out of the bag it will need to be cleaned.

The first method is to use a “Kimwipe” or other lint free wipe, dipped in isopropyl alcohol. Fold the wipe in four or so layers and dip into alcohol and apply to fiber end. Take another wipe dry and dab any excess alcohol off. If available use an aerosol duster to blow dry and remove any debris still left on fiber.

The second method is to use a cassette type cleaner such the Reel Cleaner shown . Press the level to reveal the cassette tape and being careful to try to match the angle cut of the fiber (8 degrees for SC/APC or 0 degrees for SC) rub the fiber in one direction, one time to avoid putting any debris back on the fiber. If available use an aerosol duster to blow any remaining debris off.



Figure 7

TSB-62 _____	INFORMATIVE TEST METHODS FOR FIBER OPTIC FIBERS, CABLE, OPTO-ELECTRONIC SOURCES AND DETECTORS, SENSORS, CONNECTING AND TERMINATING DEVICES, AND OTHER FIBER OPTIC COMPONENTS
EIA-440-A _____	FIBER OPTIC CONNECTOR TERMINOLOGY
EIA-455-A _____	STANDARD TEST PROCEDURE FOR FIBER OPTIC FIBERS, CABLES, TRANSDUCERS, SENSORS, CONNECTING AND TERMINATING DEVICES, AND OTHER COMPONENTS
EIA-455-1A _____	CABLE FLEXING FOR FIBER OPTIC INTERCONNECTING DEVICES
EIA/TIA-455-6B _____	CABLE RETENTION TEST PROCEDURE FOR FIBER OPTIC CABLE INTERCONNECTING DEVICES
EIA-455-9 _____	FIBER OPTIC TEST PROCEDURE FOR BUNDLE CONNECTOR
EIA/TIA-455-13 _____	VISUAL AND MECHANICAL INSPECTION OF FIBERS, CABLES, CONNECTORS AND/OR OTHER FIBER OPTIC DEVICES
EIA-455-17A _____	MAINTENANCE AGING OF FIBER OPTIC CONNECTORS AND TERMINATED CABLE ASSEMBLIES
EIA-455-21A _____	MATING DURABILITY FOR FIBER OPTIC INTERCONNECTING DEVICES
EIA-455-26A _____	CRUSH RESISTANCE OF FIBER OPTIC INTERCONNECTING DEVICES
EIA-455-34A _____	INTERCONNECTION DEVICE INSERTION LOSS TEST
EIA-455-36A _____	TWIST TEST FOR FIBER OPTIC CONNECTING DEVICES
TIA/EIA-455-158 _____	MEASUREMENT OF BREAKAWAY FRICTIONAL FORCE IN FIBER OPTIC CONNECTOR ALIGNMENT SLEEVES
EIA-455-172 _____	FLAME RESISTANCE OF FIRE WALL CONNECTOR
EIA/TIA-455-187 _____	ENGAGEMENT AND SEPARATION FOR FIBER OPTIC CONNECTOR SETS
EIA/TIA-4750000-B _____	GENERIC SPECIFICATION FOR FIBER OPTIC CONNECTORS
EIA/TIA-475C000 _____	SECTIONAL SPECIFICATION FOR TYPE FSMA CONNECTORS
TIA/EIA-475EA _____	BLANK DETAIL SPECIFICATION FOR CONNECTOR SET FOR OPTICAL FIBER AND CABLES, TYPE BFOC/2.5, ENVIRONMENTAL CATEGORY I
TIA/EIA-475EB _____	BLANK DETAIL SPECIFICATION FOR CONNECTOR SET FOR OPTICAL FIBER AND CABLES, TYPE BFOC/2.5, ENVIRONMENTAL CATEGORY II

TIA/EIA-475EC00 _____	BLANK DETAIL SPECIFICATION FOR CONNECTOR SET FOR OPTICAL FIBER AND CABLES, TYPE BFOC/2.5, ENVIRONMENTAL CATEGORY III
TIA/EIA-604	FIBER OPTIC CONNECTOR INTERMATEABILITY STANDARDS

BELLCORE STANDARDS

GR-326 _____	GENERIC REQUIREMENTS FOR SINGLE-MODE OPTICAL FIBER CONNECTORS
GR-1081 _____	GENERIC REQUIREMENTS FOR FIELD MOUNTABLE OPTICAL FIBER CONNECTORS
GR-1435 _____	GENERIC REQUIREMENTS FOR MULTI-FIBER OPTICAL CONNECTORS
SR-ARH-002744 _____	SINGLE-MODE FIBER CONNECTORS TECHNOLOGY
SR-4226 _____	FIBER OPTIC CONNECTOR CERTIFICATION
TR-73536 _____	TECHNICAL REQUIREMENTS FOR OPTICAL CONNECTORS

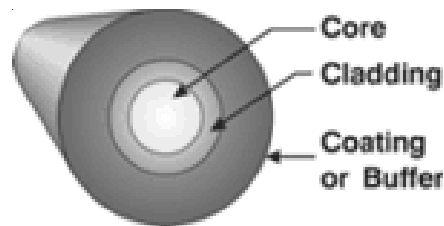


Figure 8

Link Set-ups

Equipment for link set-up:

- Multi-meter, any volt-meter will due
- Plug-in pads if required, pad size can be determined later.
- Olson Technology optical attenuator

Typical Olson Technology OTPN-1000 setup:

To set receive optical input level: To set receive optical input level

- Connect multi-meter to Receive Power Test Point and Ground Test Point.
- Connect incoming fiber to Optical Receive Input.
- Read level on multi-meter (Should read between 0.25V to 2.0V, -6dBm to +3 dBm).
- The factor setting is for 0.8V, -1 dBm for +48dBmv output. If the reading is greater than this you may use the Olson Technology optical attenuator to adjust the reading down to this. The attenuator is adjustable by different loops of the fiber, this is somewhat of a hit or miss adjustment.
- If the reading is less than this then you will have to use the Pad chart **Figure 9** below to set what the internal fixed attenuator in the OTPN-1000 will have to be set to. To use the chart, look-up the voltage reading and read how much you have to reduce or add to the pad that is put in from the factory.
- The Calculation for the Pad is: $\text{Pad} = 10 \cdot \log(\text{Voltage}/.8)$

Voltage	Delta Pad Value
.1	-9
.2	-.6
.3	-4.5
.4	-3
.5	-2
.6	-1.0
.7	-0.5
.8	0
.9	.5
1	1
1.1	1.5
1.2	2
1.3	2
1.4	2.5
1.5	3
1.6	3.0
1.7	3.5
1.8	3.5
1.9	4
2.0	4

Figure 9

- That's it, the receiver should be set.