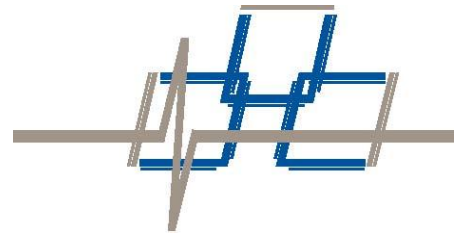

**Application
Note**



Optical Connector Cleaning

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Introduction

When working with fiber optic sensor systems, cleanliness is extremely important. Optical connectors are precision machined to exacting specifications. The alignment of the optical fibers from one to the other in a coupled pair is critical. When inserting connectors into a bulkhead, it is imperative that all surfaces are extremely clean. As the connectors come into contact with each other, tiny particles of debris can prevent proper seating and alignment, interrupt the lasers path, and create nicks and scratches in the surface of the polished optical fiber. After repeated use and over time these blemishes can become severe enough to degrade the ability of the connector to pass the laser signal, causing the sensor to fail. If this occurs the connector will need to be replaced. Proper cleaning and maintenance techniques will greatly extend the life of a connector, and improve the overall performance of the optical sensor system.



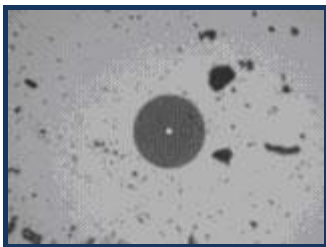
Cleaning Tools

A wide variety of cleaning tools are commercially available to aid technician in the cleaning process. The range of cleaning products is wide and varied, from wipes and swabs to push button mechanical cleaners. Wipes, commonly called fiber optic wipes or lens cleaning wipes are available in tissue paper type materials as well as lint free textile materials. There are also a number of pre-moistened wipes incorporating alcohol and non-alcohol solvents available. Swabs are used for cleaning the inside of feed through couplers and are available in many different sizes and shapes to suit the cleaning needs for many different applications. They vary in diameter, length, and type of material. Mechanical cleaners are available in two different styles. The first for cleaning the connector faces, the second for cleaning the inside of feed through couplers. Both styles typically contain a long roll of lint free textile which auto advances to provide a fresh cleaning area for each use. Many have replaceable cleaning rolls, some are disposable. It is also highly recommended that an optical connector scope is used to verify the cleanliness of the connector face prior to insertion. Many different types of scopes are available to fit almost any budget. Fiber SenSys offers a cleaning kit for our customers' convenience (980-83143).

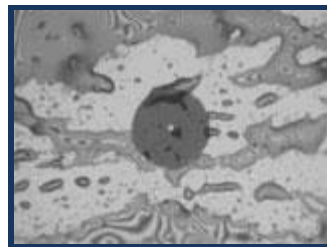


Optical Connector Cleaning

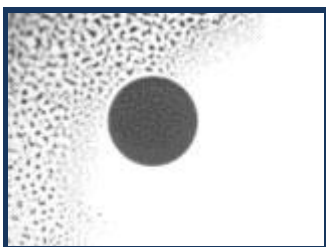
When cleaning connectors, the primary concern is the polished face. The face is the mating surface that comes into direct contact with another connector or the lens of an optical laser or detector. Any debris or residue on the connector face can have negative effect on the amount of signal that the connector is able to pass. In addition debris can be the cause of scratches and nicks in the polished optical fiber which will permanently damage the connector face. Below are some images showing connector faces as viewed through an optical connector scope.



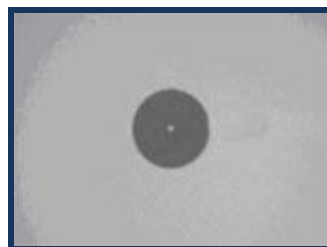
Connector face with debris.



Connector face with liquid.



Connector face with alcohol.



Connector face clean.

Cleaning the face of the connector can be done in many ways using an assortment of tools. Commonly a new clean fiber optic wipe is moistened with isopropyl alcohol or an alcohol alternative, then the connector is drawn across the wipe with light pressure. This

is followed by drawing the connector face across another new clean dry wipe in order to remove any liquid residue. Alternately, a dry mechanical cleaner can be used following the manufactures instructions. Following and initial cleaning the connector face should be inspected using an optical connector scope to verify that the face is clean and free of debris and residue. Repeat the cleaning procedure if necessary. The connector should be promptly inserted into its receptacle or covered with a clean protective cap.

Feed through Cleaning

Feed through couplers are barrel shaped components used to hold a pair of optical connectors together. The inner sleeve is precision machined to insure proper alignment of the optical fibers. The best way to clean a feed through is to unplug any connectors then moisten a new clean optical swab of the appropriate diameter (2.5mm for all Fiber SenSys products) with isopropyl alcohol or an appropriate substitute. Gently twist the swab as you insert it into the inner barrel. If possible pass the swab all the way through the coupler and out the other side. Repeat the process with a new clean dry swab to remove any remaining moisture. Inspect the inside of the feed through to verify cleanliness. Promptly insert clean dry optical connectors or cover both sides with clean protective caps.



Alarm Processor Receptacle Cleaning

The optical receptacles on the Fiber SenSys Alarm Processing Unit may also occasionally require cleaning. If an internal optical face becomes damaged due to debris or improper cleaning the APU will require factory repair which is not covered under warranty. The best cleaning technique for alarm processor receptacles is prevention. Protective caps should always be in place on the optical receptacles when not in use. Every optical connector should be cleaned and inspected immediately prior to insertion. In form the receptacle is simply a feed through coupler that can only be accessed from one side. In addition to the sleeve requiring cleaning, there is an optical face that also needs to be cleaned. The optical faces located within the APU are delicate and must be cleaned with extreme caution. Many APU models have coated optical faces which are easily scratched. To begin, moisten the tip of a new clean optical swab with isopropyl alcohol or appropriate substitute and gently insert it into the receptacle. Softly dab the swab against the optical face with a mild twist and remove. Repeat with a new clean dry swab to remove any remaining moisture. Inspect the receptacle to verify cleanliness and replace the protective cap.

Warning! In order to avoid injury, verify that the Alarm Processing Unit is powered off prior to inspection. Laser energy can be damaging to eye sight.

