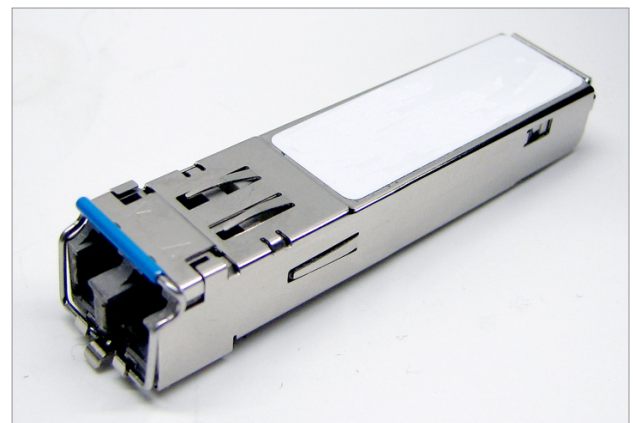


# Inspecting Fiber Optic Transceivers

Small Form-factor Pluggable (SFP)  
10 Gigabit Small Form-factor Pluggable (XFP)

## Technical Note

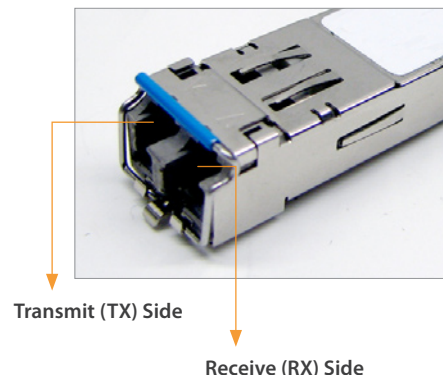


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## Overview

There are two interfaces of all fiber optic transceivers, a **Transmit (TX)** side and a **Receive (RX)** side. This paper specifically addresses the inspection of **Small Form-factor Pluggable (SFP)** and **10 Gigabit Small Form Factor Pluggable (XFP)** transceivers. The design of SFPs and XFPs can vary based on make and model.

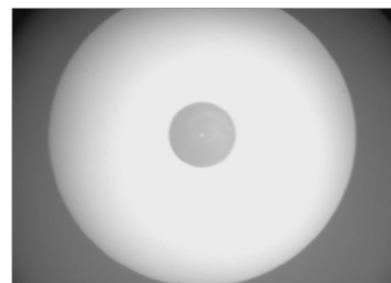


## XFP Transceiver

The **10 Gigabit Small Form Factor Pluggable (XFP)** is a protocol independent optical transceiver with interfaces (transmit & receive) both containing a small fiber stub. These transceivers are easily inspected and analyzed with Westover's probe microscope and video inspection software.



Inspect with Probe



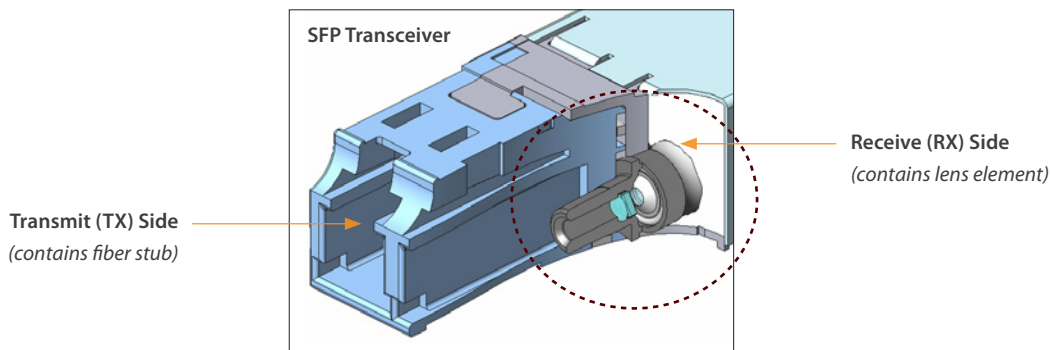
Video Inspection of Fiber End-face

## SFP Transceiver

The **Small Form-factor Pluggable (SFP)** is a compact optical transceiver used in optical communications for both telecommunication and data communications applications.

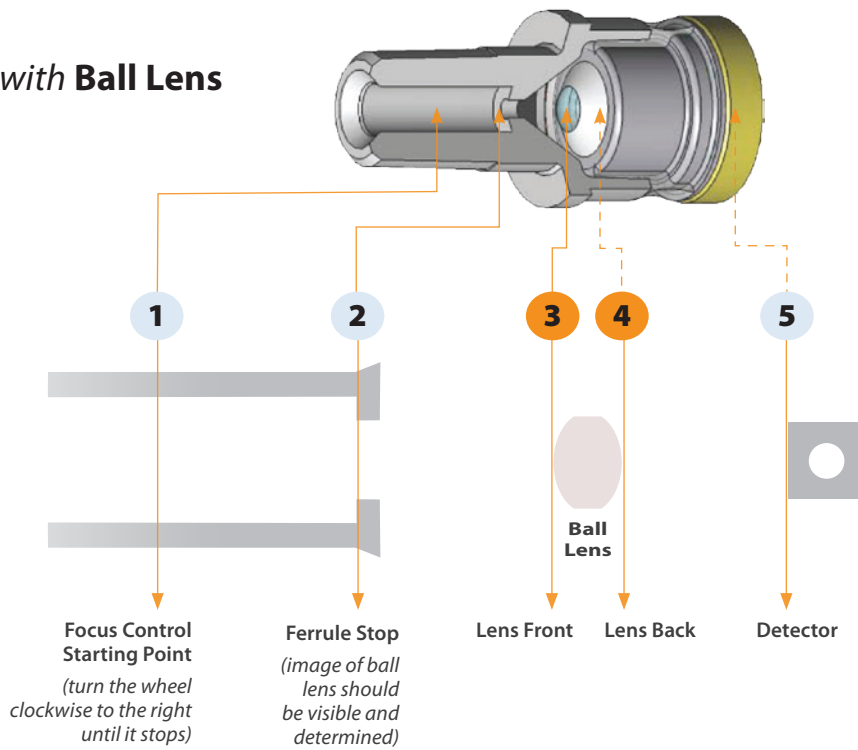
There are two interfaces of a SFP transceiver. The **Transmit (TX)** side contains a small fiber stub similar to most simplex fiber end-faces that is easily inspected and analyzed with Westover's probe microscope and video inspection software.

The **Receive (RX)** side contains a lens device represented in a variety of forms. When inspecting a SFP device there are number of different focal points that can be seen traveling the full focus range of the probe microscope. It is important to be able to recognize these different points in order to determine how best to inspect the different lens elements. The only important part to inspect is the lens element. The remaining sections of this technical note will address the inspection of the receiving side of SFP transceivers.

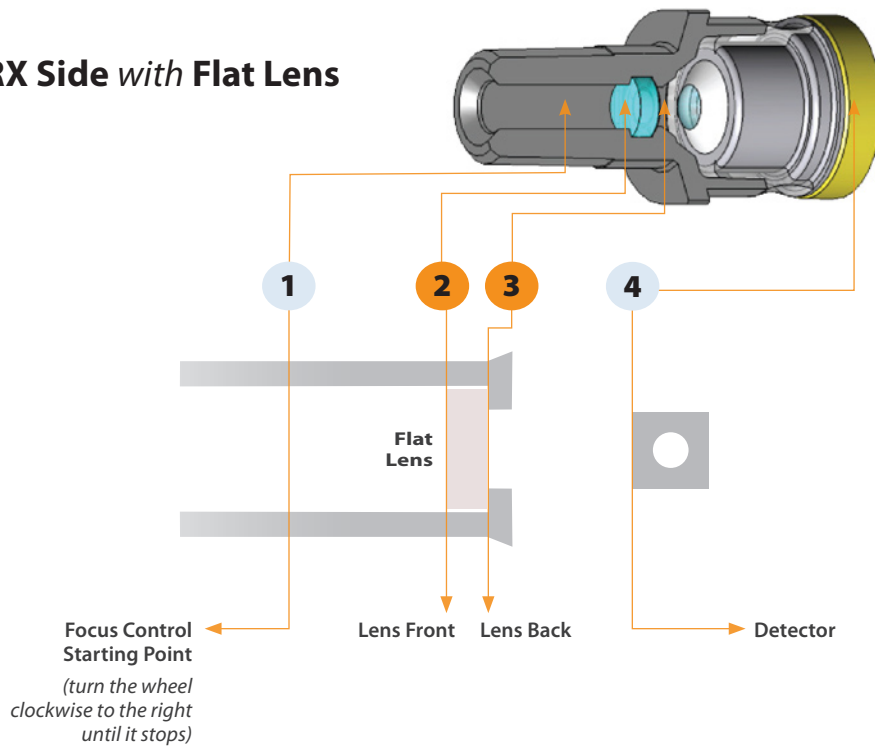


## Different Structures of SFP RX Side

### SFP RX Side *with* Ball Lens



### SFP RX Side *with* Flat Lens



## Inspecting the SFP RX Side

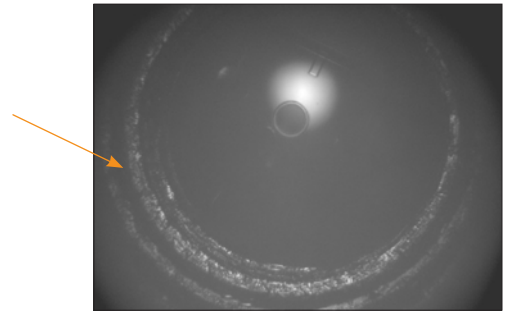
**Before inspecting the RX side, you must identify the type of lens (ball or flat) inside the device.**

1. Select the **SFP Lenses** profile in FiberChek2.
2. Turn the **focus control** on the probe clockwise (right) until you reach a stopping point.
3. Begin turning the **focus control** left until you see either of the two images below.

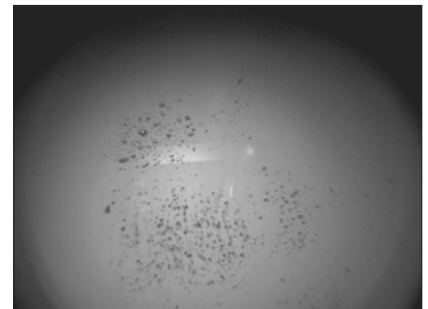


*Begin by turning the focus control all the way to the right until you reach a stopping point.*

- a. If the device contains a ball lens, the first image in focus will show a large metallic ring (**go to Ball Lens Inspection**).



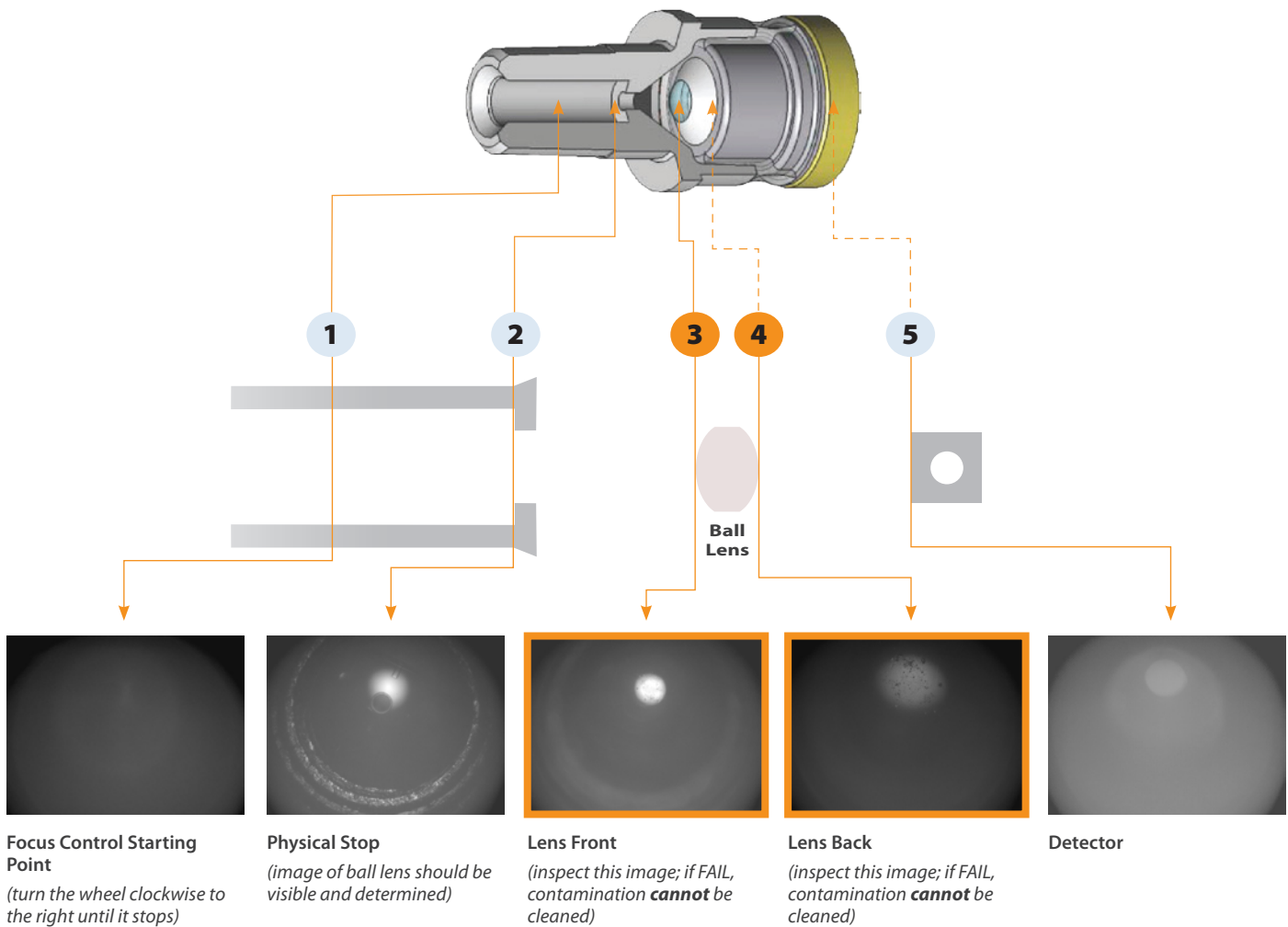
- b. If the device contains a flat lens, the first image in focus will appear as shown. This is the FRONT side of the flat lens (**go to Flat Lens Inspection**).



## Ball Lens Inspection Procedures

As you adjust the *focus control* there are 5 main focal points for Ball Lens inspection:

1. Once you have identified and determined the ball lens type, turn the focus control until you see Image 3, the FRONT side of the ball lens. Inspect this image.
2. Turn the focus control until you see Image 4, the BACK side of the ball lens. Inspect this image.



## Flat Lens Inspection Procedures

As you adjust the *focus control* there are 4 main focal points for Flat Lens inspection:

1. Once you have identified and determined the flat lens type, turn the focus control until you see Image 2, the FRONT side of the ball lens. Inspect this image.
2. Turn the focus control until you see Image 3, the BACK side of the ball lens. Inspect this image.

