Application Note

Out of Band Testing with the 930XC-30F OTDR

The 930XC-30F OTDR uses a 1625nm probe pulse to measure live or potentially live fiber optic networks. This is necessary so that network traffic is not disrupted during testing and troubleshooting processes.

1310 and 1550nm Port

1625nm Live Fiber Port

In a PON the in-band wavelengths are typically 1310, 1490 and 1550nm. The test wavelength of 1625nm is considered out of band.
The 930XC-30F live fiber port has a 1625nm filter that passes only 1625nm light but blocks all other wavelengths in both directions. The PON wavelengths are not able to pass through the filter and therefore do not go into the OTDR. If the PON wavelengths were to pass through into the OTDR (no filter) the detector diode would consider these as asynchronous noise and would they would swamp the desired 1625nm probe pulse signal rendering any measurement useless.
Since the probe pulse is 1625nm, it is able to pass through the filter and be coupled into the fiber under test. The 1625nm probe pulse will travel down the fiber with its associated reflected signals being transmitted back into the 930XC OTDR The reflected signal will pass through the filter and will illuminate the detector diode.
The 1625nm probe pulse signal will not affect the ONT (SFU) or OLT since they have a filter to block the 1625nm.

Example of the 930XC OTDR measuring from the OLT to the CO

Fiber disconnected from ONT and then connected to the OTDR via a 1m jumper

1. Disconnect the ONT at the subscriber premise.
2. Connect 930XC to the field fiber via a 1m jumper
3. Measure the field fiber towards the CO

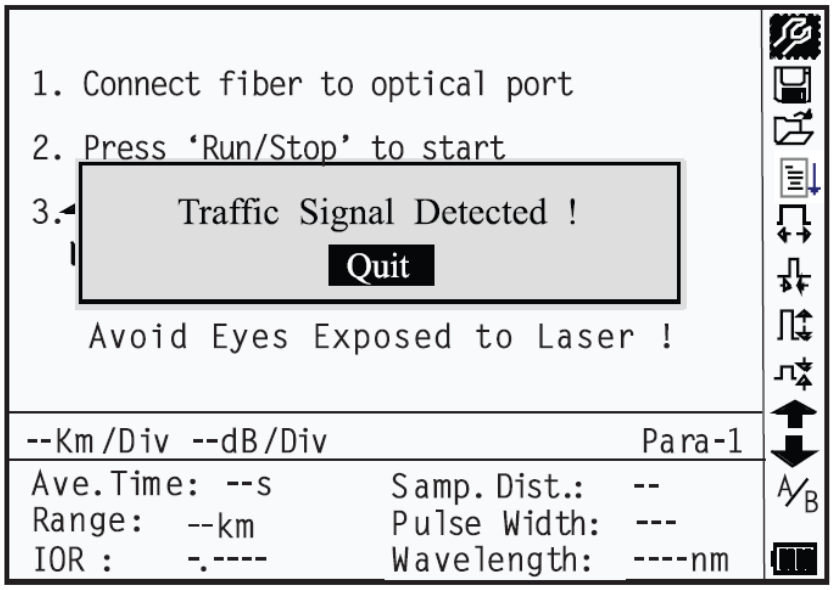
930XC OTDR Measuring the fiber towards the Central Office

The filter built into 930XC OTDR passes 1625nm in both directions and blocks the PON wavelengths that may be possible from the CO from entering the OTDR.

The technician does not always know if there are PON wavelengths on the fiber under test since they are measuring a suspected damaged or cut fiber. If the fiber is cut there will be no network traffic but if the fiber is live the 1625nm probe pulse will not disrupt network traffic. Sometimes the fiber will have a high loss due to a Macrobend. In this case the in-band wavelengths will be present but at a low level and a in-band probe pulse could disrupt network traffic. An out of band probe pulse would eliminate this risk.

Live Fiber Detect

All versions of the 930XC OTDR family have live fiber detect. If the 930XC is connected to a live fiber the OTDR will automatically sense this and prevent the 930XC OTDR from transmitting probe pulses. A warning message alerts the technician. This will prevent the technician from inadvertently connecting to a live fiber a disrupting network traffic.



Summary

- The 930XC-30F can be used on potentially live fibers without the fear of disrupting network traffic.
- The 930XC has the capability to sense traffic on the fiber and alert the technician that measurements are automatically halted.