

FSX Series

## FSXpert™ Optical Remote Test Access System

Adding value and intelligence to the network.

### Features:

- Non-intrusive and intrusive network access for monitoring or testing
- Modular system can be configured to meet network access needs
- Local or remote management
- Access to multiple test devices
- Transparency to all speeds and protocols



## The Problem

The cost of networking has been decreasing for years, but the cost of skilled labor for installation and support of intricate networks continues to rise. In a competitive market, the efficient use of valuable resources is critical. The labor costs to install a network are certainly important, but the costs to maintain and repair a network on an ongoing basis may be far more important. Efficient support is critical in this increasingly competitive environment. Because there are so many service providers fiercely competing for customers, customers feel they can change providers whenever it suits them. If a service provider allows service to lapse, he may find his customer switching to a new provider.

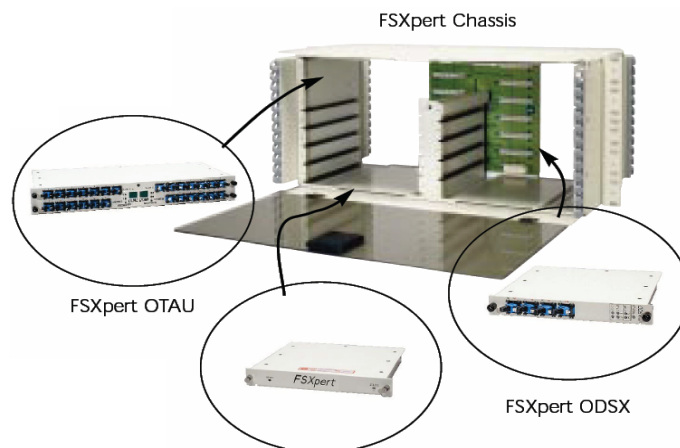
An important way for a service provider to hold down costs and improve service to customers is by improving troubleshooting. Since there is only so much that can be done to improve speed-of-repair, it can be far more productive to improve troubleshooting, identifying more quickly which lines, segments, and devices are in need of repair. By taking a proactive stance and finding a problem before it becomes a hard failure gives the service provider the flexibility to choose the best way and time to address the problem.

This approach requires ongoing, scheduled testing of all facilities, "problem" and "healthy" facilities alike. A tool for performing this testing would benefit from several features:

- Allowing traffic to flow normally while the test is performed
- Being able to test from a local or remote location
- Protocol independent – system can be utilized to access ATM, SONET, SDH, etc.
- The ability to create a loopback for fault isolation

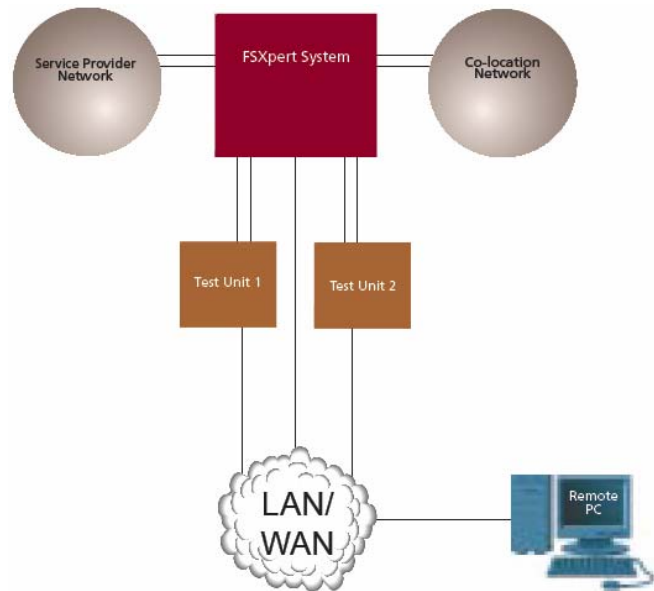
## The Solution

There is a testing mechanism that meets all of these requirements. The FSXpert Optical Remote Test Access System manufactured by Alcon Technologies provides network operators with non-intrusive and intrusive access into a fiber optic network for testing or monitoring. The system is modular and can be configured to meet the needs of the customer's network. An FSXpert chassis can include a Controller, Optical Test Access Units (OTAs) and ODSX modules (used to access the optical network to perform non-intrusive, intrusive testing and monitoring). Graphical user interface (GUI) software controls the system either locally or remotely. It is protocol independent, allowing users to utilize the system for accessing their circuits whether they are ATM, SONET, SDH etc.



## Applications

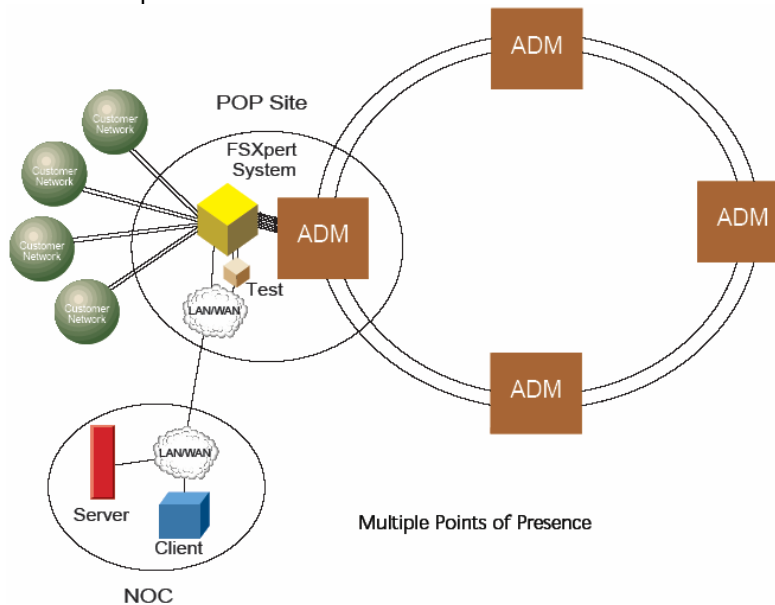
Problems can occur at any point within a network. In the increasingly complex world of communications, customers can and do receive service from many providers; a single service provider no longer controls or owns all the elements of a network. Whether your network contains multiple points of presence or you are in a co-location application, deciding where a problem is, and who has ultimate responsibility can be difficult, time-consuming, and potentially costly. Demanding customers have choices; competing providers are always ready to step in, so assuring reliable, quality service is more critical now than it ever was.



Co-location

With the FSXpert system in place, you can analyze the network by performing a variety of tests from a remote location. From this remote location, you can uncover a potential problem before it becomes a problem and you can determine fault responsibility. If the fault is isolated to circuits outside your network, there is no need to dispatch a technician. If the fault is found to be within your network, you can proceed to correct the problem.

With the FSXpert system strategically placed at Point of Presence (POP) locations, circuits added or dropped off Add-Drop Multiplexers (ADMs) can be remotely accessed for monitoring or testing from a Network Operations Center or other location. The FSXpert system can be custom configured to accommodate the number of circuits you need to access, as well as multiple test units.



Multiple Points of Presence

## Test Modes

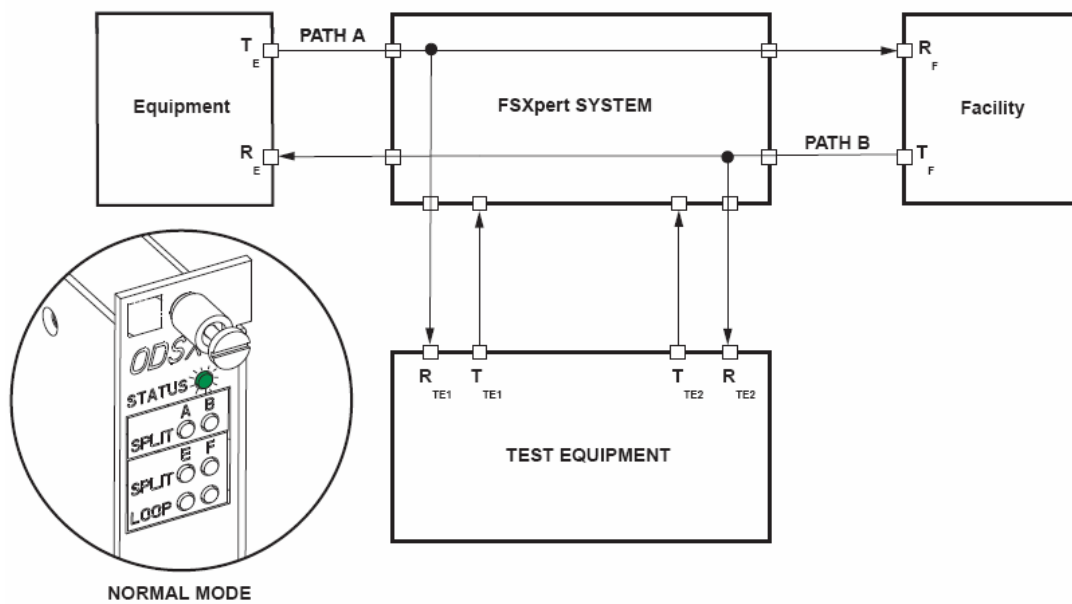
The FSXpert system offers a comprehensive choice of access modes. Network managers can use the following access modes to connect test devices to fiber optic circuits:

- Monitor Modes
- Split Modes
- Loopback Modes

### Monitor Modes

In the monitor mode, the FSXpert system uses optical splitting to tap into the fiber optic circuit without interrupting the data flow. The monitored data is sent to a test device in one of the following modes:

- Monitor E (Equipment)
- Monitor F (Facility)
- Monitor EF (Equipment/Facility)

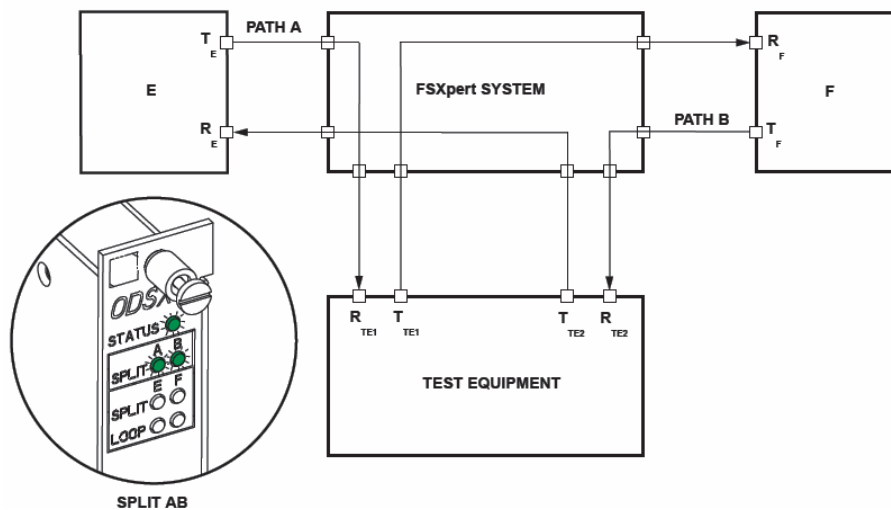


# Test Modes

## Split Modes

In split mode, the FSXpert system breaks the optical circuit and reroutes the data in one of the following modes:

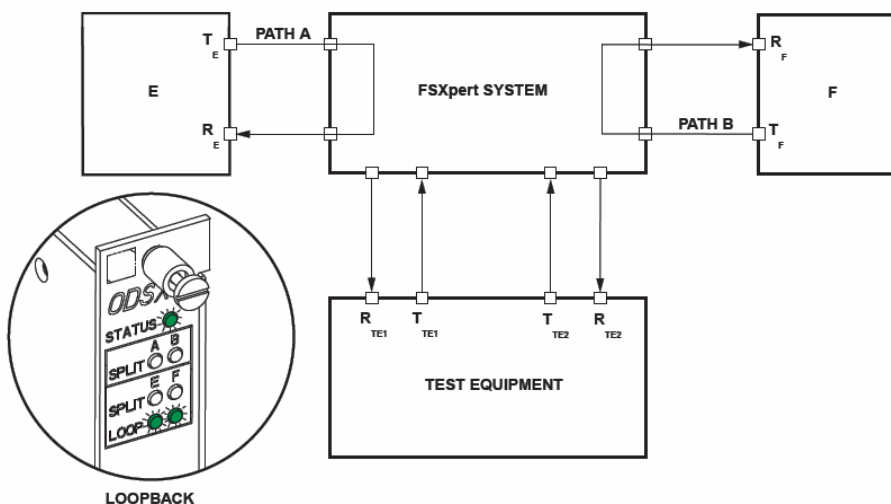
- Split EF (termination test) connects the equipment and facility sides to separate circuits on the test device. The test device can transmit and receive test patterns on both sides of the optical circuit.
- Split E
- Split F
- Split AB (drop and insert) connects the transmit side of the optical circuit through one port on the test device and connects the receive side of the optical circuit through the other port on the test device.
- Split A
- Split B



## Loopback Modes

The network manager can use the following loopback modes to return signals from the optical transmitter to the optical receiver on either the equipment or facility side:

- Loopback EF
- Loopback E
- Loopback F



## Communications Options

### RS232

- Modem connection via dial-up or dedicated line

### 10BaseT Ethernet (TCP/IP)

- Standard LAN or WAN connection

### Configuration Options



## Modular Options

The FSXpert system is a modular system with the flexibility to allow a multitude of configurations. The individual components shown can be combined to meet your specific needs.



FSXpert Chassis



FSXpert OTAU



FSXpert ODSX



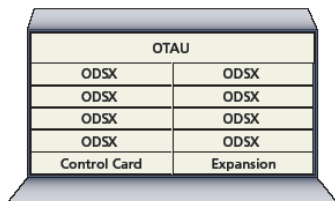
FSXpert Controller

## Common Configurations

The FSXpert system can be configured to meet your needs. Below are some of the common configurations available:

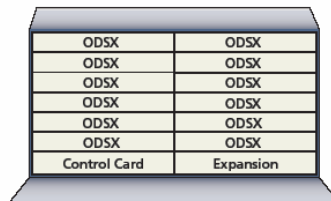
### FSXpert Chassis with Controller, 8 ODSX modules, and 1 OTAU.

The OTAU can be configured with a single 1 x N switch or a dual 1 x N switch.



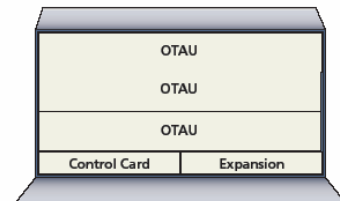
### FSXpert Chassis with Controller and 12 ODSX modules.

An ODSX module is required for each optical circuit (two fibers "TX & RX"). The configuration below will accommodate 12 optical circuits.



### FSXpert Chassis with Controller and 3 OTAU's.

The OTAU's could be a single 1 x N or dual 1 x N.



# Specifications

## OPTICAL

Connector Types: Singlemode ST®, SC, FC, ASC, AFC, LC, LX.5®

Protocols: Transparent to all protocols and speeds, including SONET, SDH, GigE, and ATM

Insertion Loss: Transparent Mode: 0.9 dB max, 0.7 dB typical 1 Monitor: 13.5 dB typical 1

Bandpass (nm): 1310 ± 20nm and 1550 ± 20nm4

## CONTROL

Control Options: TL1, SNMP 2

Control Communications: 10BaseT Ethernet or RS232

## PHYSICAL

System Capacity: FSXpert system chassis and controller units; 1 Master chassis and controller can control up to 8 Slave chassis

System Module Capacity: 1 to 144 modules (OTAU, ODSX, etc.) per Master Controller

Rack Mounting: The chassis is compatible with WECO and EIA 19" and 23" as well as ETSI 600 mm racks

Typical Chassis Dimensions (HxWxD): 8.75" x 19" x 11.5" (22.23 x 29.21 x 48.26 cm) 3

## POWER

Power Requirements: -48 Vdc, 1 Amp per fully loaded chassis (nominal)

## ENVIRONMENTAL

Operating: 0°C to 40°C (32°F to 104°F)

### Notes:

1. Connector losses are included. Losses are dependent upon system configuration.
2. Available in future releases
3. Chassis dimensions vary with required configuration.



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