Market Central ®
www.secureswitch.com

500 Business Center Drive Pittsburgh, PA 15205 USA
412.494.2800 CAGE 1BGJ7

APPLICATION NOTES

R6501 OCX
R6000 Fiber Optic AB Switch Card with loopback
(Market Central Part #5000785)

The R6000 Series Switching Systems are Layer 1 Switches used to add access control, network backup and fail-over switching and other capabilities to data networks. This paper describes an application using the R6000 Series Switching System with special Fiber Optic AB Switch Cards in OC1, OC3, OC12, OC48, etc. optical carrier network environments.

A Layer 1 Switch is a device that operates at layer 1 in the OSI model. This type of switch redirects the flow of electrical or optical signals. It does not concern itself with bits, bytes, or protocols. Each switch has a 'common' port (referred to as C) that is latched to its associated A or B port. A R6000 Series Switching System supports any mix of electrical and optical layer 1 switching modules, up to a maximum of 16 switching modules per chassis. For applications requiring even greater capacity, multiple R6000 chassis can be ganged together to provide a scaleable switching system capable of switching up to 4080 different nodes. All switch cards in the R6000 Series system are transparent to the data, thus no configuration of the cards is needed to match it to the data they switch.

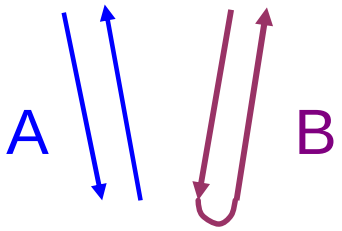
Each layer 1 switching module in an R6000 chassis is software controllable, making it a simple matter to toggle a connected device from the A to the B position remotely. Also, each switching module will continue to transmit signals even if the chassis is 'down'. That is, you can disconnect the AC power to the R6000 chassis, or even remove the management module, and each switch module will continue to pass the signals presented to it. All switching modules used in the R6000 Series Switching System use high-reliability relays (or micro-miniature mirrors for optical switch modules) that are physically latched into position. Once a position is set, it latches to retain that position. Thus the R6000 Series Switching System is nearly as reliable as the cables attached to it.

In an OCx optical carrier network environment, an R6000 Series Switching System can be installed at the demarcation point between the carrier and the OCx Customer Premise Equipment to allow the customer to switch between a primary OCx circuit and a secondary OCx circuit whenever needed. If problems arise when using the primary OCx circuit, the appropriate switching module on the R6000 can be switched to connect the CPE to the secondary OCx circuit, allowing the customer to quickly restore service. This approach however, typically has one shortcoming. Since the secondary OCx circuit is usually left "open" while the primary OCx circuit is connected to the CPE through the switch, the secondary OCx circuit could have suffered an undetected failure and may not be available when needed.

To eliminate this problem Market Central has developed the R6501 OCX Fiber Optic AB Switch Card. This new module for the R6000 Series Switching System includes additional fiber optic switching mechanisms to automatically loopback the unselected port. For example, if port A is selected, the CPE on port C will be connected to the primary OCx circuit, and the secondary OCx circuit connected to port B will be looped back to the carrier. Likewise, if port B is selected, the CPE on port C will be connected to the secondary OCx circuit, and the primary OCx circuit connected to port A will be looped back to the carrier. This allows the "unused" circuit to be continuously tested by the carrier to insure that it is operating correctly. Thus should the selected OCx circuit fail, the idle OCx will be known to be operating properly, and when connected to the CPE thru the R6000, service will be restored as intended.

Allows testing of the idle fiber optic connection by the central office.

Primary OCx Fiber Optic Connection



Secondary OCx Fiber Optic Connection

R6000 Series Switching System using fiber optic switching modules with loopback capability.

In this diagram, the CPE on port C is connected to the primary OCx circuit, while the idle OCx on port B is automatically looped back to the carrier to allow integrity testing to be performed.