



**Fiber Optic Data Link**

<p><b>Definition</b>                  A fiber optic datalink is a communications subsystem that connects inputs and outputs (I/O) from electronic subsystems and transmits those signals over optical fiber. The typical datalink transmits over two fibers for full duplex links, one fiber in each direction. Wavelength division multiplexing may be used to transmit bi-directionally on one fiber. Fiber optic datalinks may transmit signals that are either analog or digital and of many different, usually standardized, protocols, depending on the communications system(s) it supports.</p>	
<p><b>Components</b>                  A fiber optic datalink consists of fiber optic transceivers (transmitters and receivers) at either end that transmit over optical fibers. The fibers may be of any type, multimode or singlemode. Distance and bandwidth considerations may dictate the choice of the optical fiber or require regeneration.</p>	
<p><b>Performance-Power Budget</b>                  All datalinks are limited by the power budget of the link. The power budget is the difference between the output power of the transmitter and the input power requirements of the receiver. The receiver has an operating range determined by the signal-to-noise ratio (S/N) in the receiver. The S/N ratio is generally quoted for analog links while bit-error-rate (BER) is used for digital links. BER is basically an inverse function of S/N.</p>	
<p><b>Testing</b>                  Testing the operation of the transceivers with the cable plant includes optical power testing of the output of the transmitter and the receiver input power compared to specifications for the link. FOA Standards for testing cable plant loss and optical power can be used to properly specify test requirements. After the datalink is operational, testing the BER or SNR is used to confirm that the link is operating properly.</p>	
<p><b>Documentation</b>                  Datalinks should be included in all systems documentation, including equipment, transceiver power levels, test results, etc.                   See FOA Guide Reference (QR Code) for more details.</p>	