



The
LIGHT BRIGADE[®]

Your Fiber Optic Resource.

Fiber Optic System Design

W-6D-211 • ISBN 978-0-9815211-2-1 • 108 minutes • Released in June 2011

Every aspect of designing your system

Careful design and planning are vital for the long-term reliability of fiber optic systems. The Fiber Optic System Design DVD demonstrates how to design a fiber optic transmission system that will suit your requirements now and for years to come. The content focuses on issues that are critical when designing local, metropolitan, and wide area networks, including physical layout, component integration, and calculating loss budgets.

The DVD features ten chapters that can be viewed individually, based on your need and design focus. The content discusses a myriad of design processes from simple point-to-point networks to the more advanced DWDM, ROADM, and FTTH/FTTB systems. Special focus is given to the factors that can degrade signal quality, including attenuation, dispersion (for single-mode fibers), and bandwidth (for multimode fibers). New technologies for 100 Gb/s systems are discussed, and challenges and examples are provided for various applications.



Chapter Selections

The Design Process – 10:13

Proper selection and usage of the transmission equipment, protocols, fiber types, and wavelength are required to meet and maintain good end-to-end signal quality. This chapter reviews the various topologies, architectures, and other elements required in the design process.

Transmission Systems – 10:14

Active devices are required to address attenuation, dispersion, and reflection for successful system design and operation. This chapter addresses the types of active devices used in fiber optic transmission equipment and their relationship to fiber types and wavelengths.

Multimode Bandwidth – 12:39

This chapter focuses on modal dispersion in graded index multimode fibers, and the launch conditions of VCSEL sources required for Gigabit transmission. Live footage and animations allow for better understanding of the manufacturing and testing of OM1, 2, 3, and 4 multimode fibers.

Multimode Loss Budgets – 6:31

Developing a loss budget for a multimode system is vital, regardless of the system's application. This chapter covers typical fiber optic transmission equipment and the physical components used in LANs, security systems, and factory applications.

Single-mode Dispersion – 16:06

Chromatic and polarization dispersion impact systems at either high data rates or long distances. This chapter examines 100 Gb/s systems, methods of dispersion compensation, and new technologies including frequency-shift keying, forward error correction, and coherent detection.

Single-mode Loss Budgets – 9:50

This chapter details the development of fiber optic loss budgets for point-to-point single-mode systems that use G.652 and G.655 fibers. Topics covered include types and examples of sources and detectors used in short and long haul spans, and safety margins.

WDM Systems – 18:34

Wavelength division multiplexing expands the transmission capacity of fiber spans by combining wavelengths within ITU-standardized optical bands. This chapter examines how CWDM and DWDM systems are used in long haul, metropolitan, traffic, and FTTx applications. Optical amplification, optical add-drop multiplexing, and system design software are also discussed.

ROADMs – 9:25

Reconfigurable optical add/drop multiplexers consist of wavelength selective and tunable products that can remotely provision DWDM networks. This chapter reviews the types, options, and issues and challenges related to incorporating ROADMs in your network.

FTTH – 6:38

For those involved with FTTH and FTTB systems, this chapter examines the options available for point-to-point active Ethernet systems and point-to-multipoint passive optical networks, including topologies, splitter placement options, power levels, density, and take rate, along with migration and growth for next generation FTTH systems.

System Integration – 8:26

This chapter focuses on how physical layer products, including fiber, cable, connections, splices, panels, closures, and cable management cabinets are selected and integrated into operational systems for outside plant and premises installations.

Bonus Materials – Quizzes in Word format, with both student and instructor versions.