

_OptLink

OptLink V6
Optical transmission links

What is OptLink?

OptLink is a suite of interactive, multimedia courses designed to run under Windows™ XP, Vista or Windows 7.

OptLink provides an introduction to the principles of optical fibre transmission, describes the components of passive optical links and discusses testing and maintaining optical fibre links.

OptLink can be used by itself or to prepare trainees for hands-on equipment-specific training.

OptLink includes interactive OTDR simulations, allowing trainees to test various combinations of link components with different test parameters — resulting OTDR displays are explained — without tying up expensive test gear and optical fibre resources.

Target audience:

OptLink is designed for study by those who are, or intend to be, involved in the installation, testing and maintenance of optical fibre links. Starting with optical theory and finishing with the organisation of splice enclosures, OptLink emphasises the practical aspects of installing, maintaining and testing optical networks.

Training delivery:

Study on-line over a corporate intranet or the Internet.

OptLink consists of two separate but integrated courses:

- A Optical fibre principles
- B Fibre jointing and testing

Each OptLink course:

- provides typically over 8 hours of in-depth, authoritative technical training.
- uses interactive simulations, hypertext links and question sessions to involve the trainee fully in the learning experience.
- provides personalised training - each trainee can make his/her own notes and place book marks. A record of progress and level of achievement is recorded for each trainee.
- provides a structured assessed course and can also be used to browse for revision or reference.
- can be studied in isolation or as an integrated suite; each chapter of a course includes revision links to relevant subjects covered in the other OptLink course.

Pre-requisite:

This course assumes the trainee already has a basic understanding of the principles of digital transmission. It is recommended that the PTT online course SRA: “Analogue and digital signals” is studied before attempting this course.

Course Aim:

After completing this course a trainee will be able to explain the basic principles of optical fibre transmission, describe the main components of optical links, appreciate the hazards of optical sources, and calculate the power budget of a link.

Course Objectives:

At the end of this course, the trainee will be able to:

Describe the basic structure of an optical fibre and explain how infrared energy is propagated down the core of a fibre.

Give examples of the applications of optical fibre transmission including those in the access and core networks of telecommunications service providers.

Describe the causes and effect of modal, chromatic and polarisation mode dispersion.

Describe the structure of different types of glass fibre (including multimode and singlemode fibres) and compare their characteristics.

Explain that OSI/IEC and ITU standards exist which specify the characteristics and capabilities of various types of multimode and singlemode fibre.

Describe the features, characteristics and uses of different types of fibre connection including mechanical splices, demountable connectors and fusion splices.

Describe the components of an optical link including lasers and Light Emitting Diodes (LEDs) and the role of Optical Line Terminating Equipment (OLTE), regenerators and optical amplifiers.

Explain the significance of the IEC classification of optical sources according to the hazard they present.

Explain the main causes of optical loss in a fibre transmission system and discuss methods of minimising those losses.

Explain the significance of a “power budget” for an optical link, explain the meaning of the terms: receiver sensitivity, launched power, system margin and dispersion penalty and calculate the maximum length of a link for a given set of link parameters.

Number of modules: 8

Study time: 9 hours

Pre-requisite:

An understanding of the principles of optical fibre transmission and the causes and effects of optical loss. It is recommended that the e-learning course OptLink course A: "Optical fibre principles" is studied before attempting this course.

Course Aim:

After completing this course a trainee will be able to describe the components of a passive optical access network, describe the processes involved in terminating optical fibre cables and carry out and interpret basic test measurements on an optical fibre.

Course Objectives:

At the end of this course, the trainee will be able to:

Describe and demonstrate the use of an optical source and power meter to carry out an insertion loss measurement.

Explain how an Optical Time Domain Reflectometer (OTDR) measures the loss of a fibre system and measures and locates fibre joints and connections.

Explain the concepts of deadzone and resolution as relating to the characteristics of OTDRs.

Describe the facilities of modern OTDRs and interpret the results of OTDR tests.

Describe and demonstrate the purpose and operation of the various tools used in preparing fibres and cables for jointing.

Explain how a fusion splice is produced between two fibres using typical fusion splicing equipment and discuss the effects of incorrect arc current and incorrectly prepared fibre.

Explain the purpose of the fibre protection layers used in optical cables and describe the structure and functional components of typical internal and external optical cables.

Describe the physical structure and function of the various components of a terrestrial cable system including primary and secondary flexibility points, distribution shelves and termination points.

Number of chapters: 10