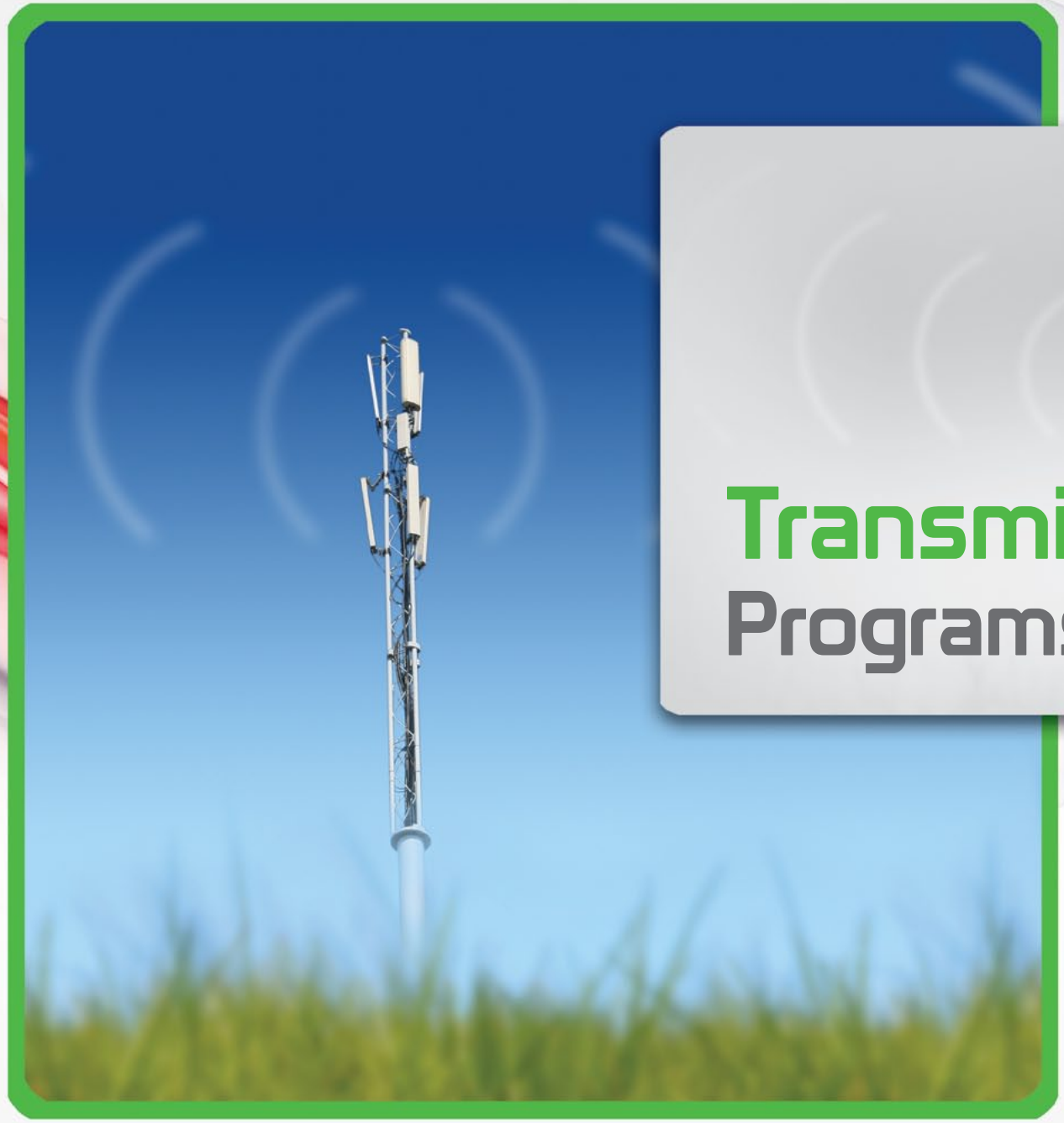


Transmission Programs

Antennas

Duration : 5 Days

Target Group : Engineers and technicians working in the field of wireless communication

Aim : By the end of this program the trainee should be able to know the Antenna usage, categories, Reciprocity, Resonant frequency.

Contents

The Electromagnetic Spectrum

Antenna usage, categories

Reciprocity ,antenna Parameters(resonant frequency impedance

gain radiation pattern polarization efficiency and bandwidth).

Basic antenna models Effect of ground

Practical survey

Prerequisites : – Knowledge of wireless communication.

Satellite Communications

Duration : 10 Days

Target Group : Engineers and technicians working in the field of wireless Communications.

Aim : By the end of this program the trainee should be able to Know:
- Fundamentals of satellite communications.
- Earth station &digital technologies -VSAT applications.

Contents

1-Propagation of radio waves-1

2-Transmission principals

3-Single Sideband working

4-Satellite communication system

5-Microwave communication system

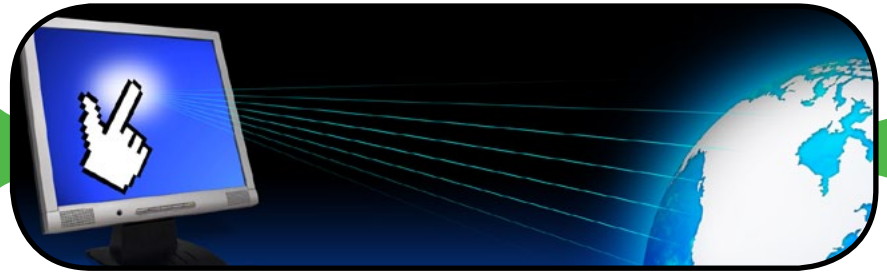
6-Multiplexing

7-VSAT

8-Practical survey.

Prerequisites : – Attendance of microwave course.

Introduction to digital electronics



Duration : 1 Week

Target Group : Students of faculty of Engineering (Grade1 Communication department)

Aim : This course aims to provide the participants with different types of logic gates its function and applications, sequential logic circuit possible, Counters, Registers and memory.

Contents

1-Digital Logic Function
Analog issues in digital circuits
Binary Numbers Overview
Digital Logic Functions
Combinational logic functions
2-Flip – Flop Circuits
Introduction to Counters
3-Register memory Circuits
Register Definition.
The Shift

Prerequisites : - Students of faculty of Engineering (Grade1 Communication department).

HIT 7070

Duration : 1 Week

Target Group : Engineers working in the field of Transmission.

Aim : By the end of this program the trainee should be able to know the performance of HIT7071 equipment ,MCF Configuration ,maintenance , administration ,traffic protection .

Contents

1- Introduction to hit7070 equipments

2- Concatenation , traffic protection

3- Synchronization ,performance management

4- MCF Configuration ,maintenance, administration ,traffic protection

Prerequisites : – PCM Basics & SDH Overview.

BTS Installation

Duration : 3 Days

Target Group : Engineers & Technicians

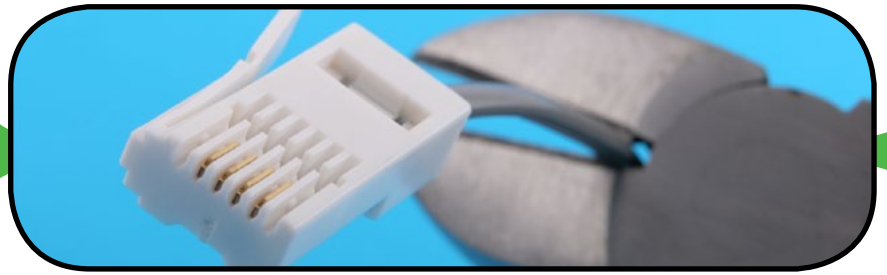
Aim : By the end of this program the trainee should be able to install BTS cabinets, ground system, the cabinets internal cables, trunk cables, Main Antenna Feeder System & install the GPS Feeder System , monitoring the installed cabinets

Contents

- Overview of BTS Installation
- Engineering Preparations
- Unpacking and Content Check
- Installing the Cabinets
- Installing the Grounding System
- Installing the Cabinet Internal Cables
- Installing the Trunk Cables
- Installing the Monitoring System
- Installing the Main Antenna Feeder System
- Installing the GPS Feeder System
- Installing the Boards
- Power ON/OFF Procedures

Prerequisites : – Attendance of GSM Course.

BTS MAINTENANCE



Duration : 3 Days

Target Group : Engineers and technicians working in the field of wireless communication

Aim : By the end of this program the trainee Recognize the spectrum band of CDMA ,BTS Cabinet Structure, CBTS I2 Plug-in-Box.

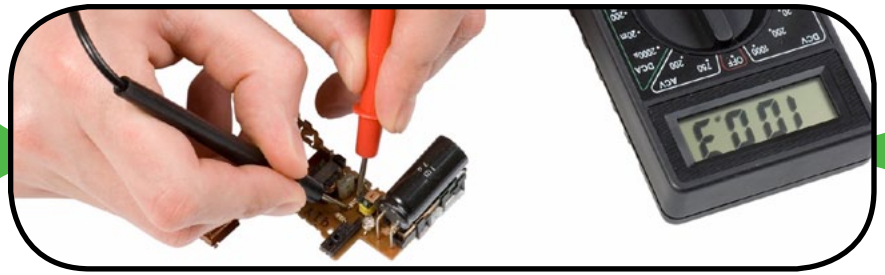
Contents

- Spectrum Band of CDMA
- BTS Cabinet Structure
- CBTS I2

Prerequisites : – Attendance of BTS Installation Course.

Transmission Programs

Measuring and Fault Location Of Fiber Optical Cables



Duration : 2 Weeks

Target Group : Engineers & technicians.

Aim : This program aims to provide the trainees with the necessary information about using measuring devices and fault location of optical fiber cables.

Contents

- Different measurements for fiber optical cables.
- Measuring loss in fiber optical cable.

1. Types of loss.
2. Calculating the total loss of fiber optics cable.
3. Measuring welding loss.

- Block diagram of loss measuring devices for fiber optics cables.

1. Block diagram of transmitter.
2. Block diagram of receiver.

- Measuring device OTDR

1. Different measurements processes, using measuring device OTDR.
2. Printing the curve and making the comparison.

- Precautions that should be taken before using OTDR.

Prerequisites :

– Engineers and technicians working in the field of transmission.

Principles of Digital Microwave

Duration : 5 Days

Target Group : Engineers and technicians working in the field of Transmission.

Aim : This course aims to provide the participants with the knowledge, skills be acquainted with digital microwave principles.

Contents

Introduction to Digital microwave Radio Technology

- Microwave Communication.
- Components of Microwave Systems.
- Generators of Microwave Signals and Noise Effect.

VHF/UHF/Microwave Radio Propagation

- Free Space Propagation.
- Acknowledgements.

Microwave Antenna Systems and Applications

- Properties and Definitions.
- Return loss/voltage-standing-wave-ratio (VSWR).
- Solid parabolic Microwave Antennas.
- Flanges.
- Antenna Options.

Practical survey

Prerequisites :

- Basic Knowledge of Transmission
- The trainee should have a good knowledge in English language .

SDH Alcatel

Duration : 2 Weeks

Target Group : Engineers and technicians in the field of transmission.

Aim : By the end of this course the trainee should be acquainted with: different types of transmission systems, Alcatel first generation SDH equipments, ALCATEL Optinex Multiservice Node SDH Equipments and SDH Network Management & Synchronization.

Contents

1) Transmission Systems
* Pulse Code Modulation (PCM).
* Plesiochronous Digital Hierarchy (PDH).
* Synchronous Digital Hierarchy (SDH).

2) Alcatel first generation SDH equipments
* Alcatel 1641 SM front view, slot assignment, features and equipment protection.
* ALCATEL 1651 SM / 1661 SMC front view, slot assignment.
* ALCATEL 1641 SMD front view, features and equipment protection.
* 1631 FOX front view and features.

3) ALCATEL Optinex Multiservice Node SDH Equipments
* ALCATEL 1650 SMC front view, traffic units, access modules, slot assignment and equipment protection .
* ALCATEL 1660SM front view, traffic units, access modules, slot assignment and equipment protection .

4) SDH Network Management & Synchronization
* SDH Management Network.
* Management Levels and interfaces.
* Synchronization for 1651 SM & 1660 SMC.
* Synchronization for 1650 SMC.
* Synchronization for 1660 SM.

Prerequisites : - Engineers and technicians working in the field of Transmission.

Transmission Programs

SDH Overview

Duration : 2 Days

Target Group : Technicians.

Aim : This program aims to provide the trainee with the necessary knowledge and skills to be acquainted with the general structure of SDH network and reasons for replacing PDH system with SDH system and to be acquainted with DWDM system.

Contents

- Introduction to data network.
- To be acquainted with PDH system.
- To be acquainted with SDH system.
- To be acquainted with DWDM system.

Prerequisites

– Engineers and technicians working in the field of transmission.

SDH (SLD64) Equipments

Duration : 1 Week

Target Group : Engineers and Technicians.

Aim : By the end of this course the trainee should be acquainted with:
- Describing the operation of the synchronous digital hierarchy (SDH).
- SL64 components.
- Functions of the SL64 Units.
- Fault detection and correction of the (SDH).

Contents

Racks
- Rack equipping.
- Terminal panel.
- Power supply connection.

Functionality of the SDH(SL64)
- System architecture
- Principle functionality of the modules.
- Types of connectors.

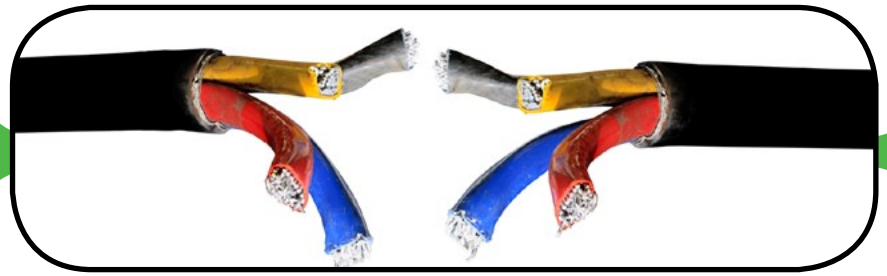
Operation of SDH(SL64)
- The craft terminal.
- Main Window of the application software of (SL64).
- Configuration of module Equipping.
- Configuration of Ports.
- Cross-Connections and Test Loops.
- Protection features of the (SL64).
- Synchronization Facilities of (SL64).

Maintenance
- Fault clearance for hardware Alarms.
- SDH Alarm structure.
- Fault clearance tables.
- Field Maintenance.

Prerequisites

Engineers and Technicians working in the Transmission field.

SDH (SLD 16) Equipments



Duration : 1 Week

Target Group : Telecommunication Engineers & Technicians.

Aim : This course aims to acquaint telecommunication engineers and technicians with the components and units of SLD 16 device, detecting and eliminating faults.

Contents

1) Hardware
* Rack and terminal panel.
* Subracks.
* Interface & Auxiliary Cards.

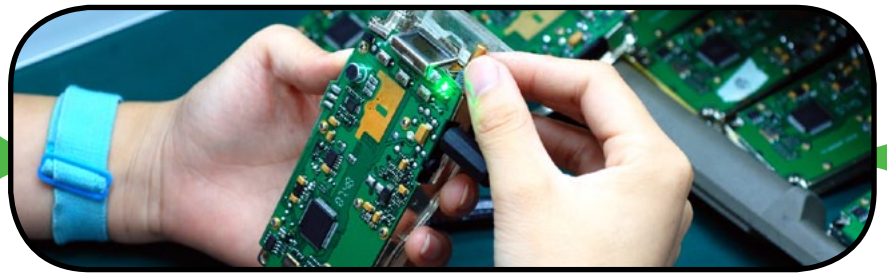
2) Functionality
* System Architecture.
* Configuration Types.
* Subracks Equipping Options.

3) Operation
* The Craft Terminal.
* Application Software Window.
* Protection Features.
* Supplementary Functions .

4) Maintenance
* Alarm Handling.
* Fault clearance Measures.
* Field Maintenance.

Prerequisites : Basic knowledge of transmission.

SDH Measurement and Testing Equipments



Duration : 1 Week

Target Group : Telecommunication Engineers & Technicians.

Aim : By the end of this course the trainee should be acquainted with the types of measurement devices used in testing transmission equipments.

Contents

1) Victoria SDH/SONET/PDH analyzer
* Description of the instrument.
* Graphical /user Interface.
* National Exchange.
* In- service & out-of-service measurements.
* BER tests.
* Error performance.
* Basic procedures.

2) N3970/N3971A Optical Power Meter
* Getting started and turning on.
* Auto test operation.
* Power meter operation.
* Care of your instrument.

3) N3974A Dual Laser Source
* Getting started and turning on.
* Auto test operation.
* Dual laser source operation.
* Memory.
* Care of your instrument.
* N3974A Dual laser quick reference guide.

Prerequisites : Basic knowledge of transmission .

Transmission Programs

Principles of O&M For transmission network

Duration : 8 Days

Target Group : Engineers and technicians working in the field of Transmission.

Aim : This course aims to provide the participants with the introduction of optical fiber basics, splicing, testing, PCM ,PDH , SDH principles , Management, testing.

Contents

Introduction to OPTICAL FIBER

Optical Fiber Network testing , measurements, Maintenance &Design

PCM Basics .

PDH and SDH Systems

SDH Network Management & Synchronization

PDH and SDH Measurements and Testing

Prerequisites

– Engineers and technicians working in the field of Transmission

Antenna towers maintenance

Duration : 1 Week

Target Group : Engineers and technicians working in the field of wireless communication

Aim : By the end of this program the trainee should be able to :

* Antenna systems ,types, tests.
* basics of towers construction
* Towers protection

Contents

1- Basics of antenna systems

2- Towers components

3- Towers types

4- Towers protection

5- Towers installation& maintenance

6- Practical

Prerequisites

– Technicians working in the field of wireless communications .

Optical fiber cables principles

Duration : 2 Weeks

Target Group : Engineers & technicians.

Aim : This course aims to provide participants with basic knowledge in properties and advantages of optical fiber system , installation and components of fiber cable , measurements and design of optical fiber systems .

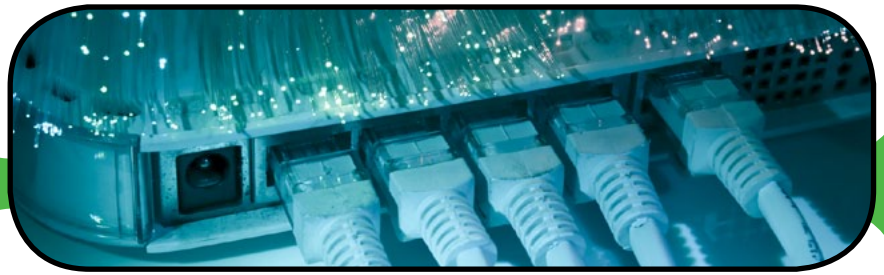
Contents

- Optical fiber development overview
- Light principles
- Optical fiber properties
- Installations and expanding of optical fiber cables
- Optical fiber cables splicing
- Light sources (light transmitter)
- Light detector
- Measurements and fault locating of optical fiber communication systems

* designing optical fiber communication systems

Prerequisites : – Engineers and technicians working in the field of transmission.

Modern optical fiber systems



Duration : 2 Weeks

Target Group : Engineers & technicians.

Aim : This course aims to provide participants with basic knowledge in optical fiber principles, how to prepare and splice fibers , how to use measuring devices and the new technology fiber to the home FTTH .

Contents

- Open system interconnection
- Light principles
- Optical fiber properties
- Installations and expanding of optical fiber cables
- Light sources (light transmitter)
- Light detectors
- Optical fiber cables connection network
- How to prepare and splice fibers
- Measurements and designing of optical fiber communication systems
- Protection of transmission network and digital cross connections
- Fiber to the home (FTTH)

Prerequisites : – Engineers and technicians working in the field of transmission.

Preparing and Splicing Fiber Optical Cables

Duration : 1 Week

Target Group : Technicians working in the field of optical fiber cables.

Aim : This program aims to provide the trainee with information and skills to be acquainted with the components and types of fiber optical cables, splicing techniques and measuring the loss as a result of splicing.

Contents

1) General overview on optical fiber cables
- Types of fiber optical cables according to transmission system.
- Advantages and disadvantages of fiber optics cables compared with copper cables

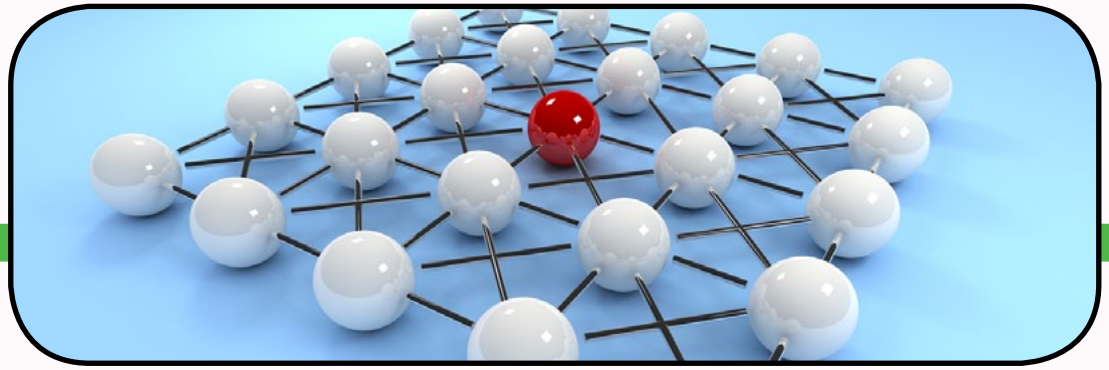
2) Components of optical fiber cables
- Types of optical fiber cables
- Structure of optical fiber cables

3) Cable splicing process.
- Preparing cables for splicing
- Types of splicing components
- General operation theory of automatic splicing machines
- Steps of manual splicing
- Mechanical splicing

4) Losses in optical fiber cables
- Types of losses in optical fiber cables
- Measurements and calculations of total loss in optical fiber cables

Prerequisites : At least high school graduates working in the field of optical fiber cables.

Principles of digital communication



Duration : 1 Week

Target Group : Telecommunication Engineers & Technicians.

Aim : This course aims to provide engineers and technicians working in the field of digital exchanges and transmission with the knowledge, skills and attitudes necessary to be acquainted with the principles and different types of pulse modulation.

Contents

1) Pulse modulation
2) Pulse amplitude modulation
3) Time division multiplex for pulse amplitude modulation signal
4) Pulse code modulation (PCM)
5) Line code

Prerequisites : Basic knowledge of transmission and digital exchanges.