Hands-On

# DSL Comb Tech

Installation, Maintenance, Troubleshooting & Customer Support

## Course Description

This combination 3-day Hands-On course will cover the following

Hands-On xDSL Installation, Maintenance & Troubleshooting including CAT5 & CAT6 Preparation, Installation & Testing

This 2-day Hands-On course provides in-depth instruction for Installing, Maintaining and Troubleshooting DSL services for technicians. Attendees will learn the inner workings as to how the DSL works and the loop parameters required providing Uninterruptible service.
This will include residential, commercial and industrial environments. This is a Hands-On course that uses state of the art testing equipment. Meters will be used to check loop parameters and will train your technicians Line pre-qualification, line performance, DSL customer-end equipment installation and troubleshooting is the primary focus of this course.

Combined with

Hands-On xDSL for Customer Support (CS Provision, Maintenance & Troubleshooting)

This 1-day Hands-On course provides Real-World Experience for help-desk and technical support personnel to solve customer related issues relating to their DSL installation, set-up, connection and services.

This course will provide students the practical skills to solve DSL Customer Support issues, fast and effectively. Upon completion students will receive a BreakThru DSL Quick-Fix-Card that will guide you step-by-step through proven procedures that will target the specific problem whether it is a line down, incorrect PC settings, defective modem/router or just basic user difficulties, you will have the answers and skills you need to SAVE company TIME & MONEY and most of all to achieve CUSTOMER SATISFACTION!

You can't afford to operate on a "plug and pray" basis in today's competitive
market. Our SMEs have the field experience to find the answers to real live scenarios, providing students with a Real-World Experience

## Students Will Learn

- **DSL Applications**
- **Cable Channels Over the Copper Pair, Internet Access,**
- **Video on Demand, Video Conferencing, Voice Over IP, more...**
- **All Types of xDSL**
- **ADSL ( + & 2 ), ISDL, HSDL, RADSL, SDSL, VDSL, VDSL2+, CDSL, UDSL**
- **DSL System Components & Configurations for Residential & Business**
- **Modems, Splitters, Filters, more**
- **Hands-on Exercises using Sunrise, Acterna, DynaTel, Sidekick, and any additional meters to synchronize**

**with DSLAM, and interpret results...**
- **Turn up Results Margin Capacity, Upstream, Downstream, Maximum Bit rates, more...**
- **DSL Loop Parameters & Cable Acceptance Distances, Speeds, Cable Pair-Testing and Qualifications.**
- **CAT5 / CAT6 Cable Preparation, Install & Testing Latest Standards, Tools, and Techniques used for cable installations, plus Speeds, Cable Testing and Qualifications.**
- **Hands-On Testing & Troubleshooting DSL Circuits, Test Equipment, and more...**
- **Troubleshooting Identify Customers Related Problems, Defective Lines and Equipment.**
- **And More**

## Target Audience

OSP Technicians, CO Technicians, ILEC Installation, Repair and Maintenance Technicians, CLEC/ASI ADSL Installation Technicians, CLEC/ASI Network Technicians, DSL Technical Support Technicians, DSL Group Managers Sales & Marketing Support Managers and anyone requiring Hands-On skills for supporting, installation and/or maintenance of DSL services.

## Prerequisites

Basic electrical and telephony concepts. This information can be obtained in our course(s)
-TeleCom I or II
-Basic Electricity & TeleCom Electronics

## Course Outline

Module I. Understanding xDSL

- Terms and Acronyms
- History of xDSL
- Types of xDSL
  - ADSL
  - ADSL2/ADSL+
  - SDSL
  - HDSL
  - VDSL
  - VDSL2
  - IDSL
  - RADSL
  - CSDL
  - UDSL
- xDSL and Applications
  - Cable Channels Over the Copper Pair
  - Internet Access

Video on Demand
Video Conferencing
Voice Over IP

Module II: Components of a DSL System

Modems
Splitters
Filters
ATU-C/ATU-R
DSLAMs
Hubs
Routers
Switches

Module III: Digital Transmission

Explanation of bits and bytes
CAP/DMT line code
Converting digital to analog
Error detection schemes
Frames and Superframes
System parameters
Design applications
Examples of download/upload systems
Loop parameters
Capacity
Margin
Interpreting LINK TRUN-UP RESULTS
Bits Graphic
Explanation of all DSL connection results

Module IV: Loop Qualification & Testing

Distance versus bit rate
Gauge/quality of cable
Bridge taps
Load coils/Smart coils
Power influence
Explanation of test equipment used in ADSL
Acterna/Sunrise/Dynatel/Harris/Sidekick/Any type brought to class
Complete a 10 step troubleshooting procedure
Field tested and proven successful
Testing and explanation of physical faults
Shorts/grounds/crosses/splits/opens (high joints)
Interferers
T1/AM radio/other high frequency interference issues
Insertion loss

TDR traces and testing

***ALL Hands-On TESTS WILL BE COMPLETED BY THE
ATTENDEES USING THEIR OWN METER OR BTS WILL PROVIDE A METER FOR THEM.

Module V: Troubleshooting xDSL

- Common Technical Support Issues
- Step-by-step walk through
- Splitter Installation
- Modem Synchronization
- PC Installation Procedure
- Software Configuration
- Testing
  - Ping Testing
  - Trace Routs
  - Overall Factors to Consider
- Software Speed Tests ( Upload & Download Mgmt. )
- QuickCard Guide (step-by-step checklist )

Module VI: Case Studies & Troubleshooting Tips

- Discussion of issues associated with customers
- Aerial and buried drops
  - Twisting/bonding and grounding
  - Protectors
- Inside wire
  - Cables Cat 3/Cat 5/Cat 6
    - Building and Testing Cables
- Basic troubleshooting tips at the PC
  - Correct cords
  - Network Interface Card Installation ( NIC)
- QuickCard Guide (step-by-step checklist )
- Case Studies
- Problem Solving Techniques that Work

## Notes

Featured Equipment

Acterna HST3000
Sunrise Sunset xDSL
3M DynaTel 965 DSP
Tempo ( Sidekick )
CAT5/CAT6 Cable Testers

(Other equipment i.e. Harris, Panasonic Tough book can
be incorporated upon request.)
And more...

## Equipment Requirements

**(This apply's to our hands-on courses only)**

Instructor led with numerous Hands-On labs and exercises.

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

## Course Length

3 Days