

Hands-On

# Cable Broadband Premises Installation and Service



## Course Description

This Hands-On Broadband Premises Installation and Service for Cable Telecommunications course covers the knowledge needed to install and troubleshoot triple play services (voice, video, and data) for Cable Customers.

This will provide a comprehensive overview of a broadband cable system, a working knowledge of the system from the signal sources to the customer premises equipment, while teaching the requirements for an installer. The why as well as the how to perform installer functions are taught throughout this course, providing the student a Hands-On proper installation as well as basic troubleshooting techniques.

The student will also learn customer service, the processes and procedures surrounding digital signal tests and measurements, troubleshooting, test equipment, measurements and service restoration related to industry-wide standards and practices, (Specific references to more than 50 basic safety standards (OSHA and ANSI) as well as electrical codes (NEC and NESC) are made throughout the course.) as well as instruction in the latest technologies, such as MoCA, IPv6, Home Networking, untethered devices and more.

## Students Will Learn

- The operation of a broadband cable system
- The typical departments within a broadband cable company
- To understand the safety regulations, customer service requirements, functions of drop components and connection/interface of customer premises equipment in a broadband drop system
- To identify customer concerns and solve customer problems
- How to correctly use and maintain all required installation hand and power tools
- To fully understand required ladder inspections and practice safe ladder handling techniques
- What the required pole climbing safety inspections and safe pole climbing procedures are.(Refresher)
- To identify features, controls and components, perform measurements and properly maintain digital multi meters and signal level meters.
- The construction of coaxial drop cable and F-connectors and properly install various indoor and environmentally sealed F-connectors
- How to safely and correctly perform single resident aerial and underground installations from the tap to the customer
- About premises equipment, following all pertinent safety regulations and recommended practices/procedures
- Be able to interpret digital measurements to evaluate digital signal quality
- All the necessary processes, techniques and equipment to function as a tap-to-customer premises installer
- To Effectively troubleshoot commonly occurring broadband analog and digital drop problems
- To explain the differences in programming services to the customer
- The topics to help prepare for SCTEs Broadband Premises Installer certification
- And more...

## Target Audience

This course is a must for any New hires and anyone wanting to enter this feild. This course is also a benefit for experienced technicians and installers interested in a refresher on current Cable Broadband installation and service techniques.

## Prerequisites

Basic telephony would be helpful.

## Course Outline

### Module 1: Introduction: From Dispatch to Customer Premises

- The architecture and key components of modern cable telecommunications networks.
- The architecture and key components of the last mile hybrid fiber-coaxial (HFC) access network.
- Understand how signals from the content providers flow through the cable network to devices in the customer premises.
- Understand the role that attitude, appearance, and performance, on and off the job, play in projecting a professional

- and company image.
- Identify and use positive self-talk for maintaining a positive attitude and becoming self-motivated.
  - Explain the role of accountability in your work.
  - Describe professional appearance, and how it contributes to company image.
  - Describe vehicle appearance, and how it contributes to company image.
  - Identify methods for managing stress on the job.
  - Identify methods for managing time on the job.
  - Interacting with dispatch
  - Tools and equipment
  - Vehicle inspection
  - Competitive services

### **Module 2: Work Order 1: Aerial Disconnect**

- Park safely and courteously
- Inspect and wear safety equipment inspect
- Carry and climb extension ladder
- Inspect pole and tap
- Disconnect a drop cable
- Close a work order

### **Module 3: Work Order 2: Underground Basic Reconnect**

- Locate, identify, and inspect a pedestal
- Steps to run the underground drop cable from the tap to the premises
- Inspect drop cable
- Connect drop to tap
- Inspect drop bonding
- Check for hot chassis
- Connect CPE
- Troubleshoot an installation
- Identify leakage and ingress

### **Module 4: Work Order 3: Aerial Premium Installation**

- Plan and route aerial drop
- Inspect, adjust and use pole climbing equipment
- Describe the steps for installing a P-hook
- Connecting the drop cable mid-span
- Connecting the drop cable to a lift pole using a J-hook
- Describe how to tag the drop
- Describe what cable clearances need to be considered
- Describe the steps for reconnects, upgrades, downgrades, and disconnects
- Run and bond cable to a house ground
- Safely drill wall holes

- Take digital signal readings at the tap

#### **Module 5: Work Order 4: Underground**

- High Definition Installation
- Plan and route underground drops
- Locate buried utilities
- Bury the drop cable
- Use a time domain reflectometer (TDR) and DMM
- Connect Cable box and HD set-top box
- Test services

#### **Module 6: Work Order 5: Aerial Home Theater Installation**

- Install additional outlets
- Perform external cabling
- Use bucket truck at tap (refresher)
- Fish cable through interior walls
- Connect a home theater system (Audio, Video, Signal, HDMI, Fiber Connect, Ethernet, etc.)

#### **Module 7: Test Equipment and Common Measurements**

- Identify the test equipment used during a premises installation, including:
  - Handheld digital signal analyzer (H-DSA)
  - Signal Level Meter (SLM)
  - TV Test Set
  - Volt Ohm Meter (VOM)/Digital Multimeter (DMM)
  - Toner and Probe
  - Signal Leakage Detector
  - Cable Locator
  - Time Domain Reflectometer (TDR)
  - Foreign Voltage Detector (FVD)
  - Polarity Tester
  - Butt-Set (Test Set)
  - Wire ID / Mapper
  - Brown Meter (Line Loop Tester)
  - UTP (Ethernet) LAN Tester
- The general purpose of each piece of test equipment and important measurements
- Explain the tests themselves and what the results indicate

#### **Module 8: Equipment Installation (Video)**

- Explain why analog equipment and services are still used in many cable TV systems

- Describe the general process for connecting and setting up the following:
  - Digital Set-Top Box (STB)
  - Digital Transport Adapter (DTA)
  - Connecting the Digital Consumer Terminal (DCT)
  - Digital Video Recorder (DVR)
  - CableCARD
  - Whole Home DVR using Multimedia over Coax Alliance (MoCA)
  - Internet Protocol Television (IPTV)
- Access and navigate through the video device on-screen menus
- Explain how to verify each video service's normal operation
- List the steps to educate the customer on each video service

### **Module 9: Equipment Installation High-Speed Data (HSD)**

- List the typical web browsers and their primary functions
- Contrast the download and upload speeds of dial-up, Digital Subscriber Line (DSL), and cable modems and be prepared to answer customer questions
- List the materials needed for the HSD installation
- Describe the tasks to be performed to connect the cable modem and install
- HSD service
- List the steps to educate the customer on the HSD service, to include:
  - Provide the new e-mail address, phone number (if an eMTA is installed), account information, and methods of contacting the company for customer service or technical support.
  - Explain any additional services associated with high-speed data service offered by the cable operator such as higher-speed tiers of service, premises network management, managed wired and wireless routers, fixed IP addresses, and other add-ons to basic high-speed data service.
  - Clearly define for the customer the services and support covered by the cable operator.

### **Module 10: Equipment Installation Telephone (Voice)**

- Explain basic telephone technology
- List safety procedures to use during a phone installation
- Describe the tasks required to perform inside wiring of phone
- Describe the tasks to be performed to install digital phone
- List the steps to educate the customer on the voice service

### **Module 11: Troubleshooting and Repair**

- Explain the proper technique of customer communication
- Describe the different types of tests used to troubleshoot and repair cable services
- Identify the 5 basic steps required to logically troubleshoot issues
- State what the acceptable operating signal levels and signal quality measurements should be
- Explain what egress and ingress are, and how these affect signal quality
- Know how to access the diagnostics available on STBs, CMs, WRMs and eMTAs
- Demonstrate the process to restore signal quality on the coaxial house drop
- Troubleshoot and explain typical resolutions for voice-related issues
- Troubleshoot and explain typical resolutions for data-related issues
- Troubleshoot and explain typical resolutions for video-related issues
- Troubleshoot and explain typical resolutions for MoCA-related issues

## Module 12: Premises Signal Configuration

- List the three basic formulas you will use when calculating premises signal levels.
- Demonstrate how to calculate total cable loss, total drop loss, and expected signal level at the ground block and at the CPE.
- Define a passive premises network.
- Review the considerations for drop amplifier placement.

## Appendix A: Safe Work Practices

- Identify the personal protective equipment (PPE) you will use on the job
- Describe the basics of electricity and precaution
- Summarize how to use a foreign voltage detector (FVD)
- Describe the general requirements for safe vehicle operation
- Understand OSHA standards
- Describe the precautions to take when working in a confined space or attic
- Describe the hazards (such as heat stress, hypothermia, and exposure), prevention, and treatment of working in extreme weather conditions
- Explain the basic precautions for post-storm and emergency operations
- Describe the hazards of working at night and in poorly lighted conditions
- Explain basic safety principles to help prevent injury

## Delivery Method

Instructor-Led with numerous Hands-On labs and exercises.

## Equipment Requirements

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

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

5 Days