

Hands-On

# Tellabs 1000 (UMC1000) LIVE Virtual System Maintenance & Troubleshooting



## Course Description

The Tellabs 1000 (UMC1000) Maintenance and Troubleshooting Course (formerly the AFC UMC1000) is designed to provide any student with a solid understanding of the various aspects of the AccessMAX/MSAP-series platform and its many features and options. The roles of a 1000 network shelf within a modern switching & transport network is explored, with discussions on its theory, options, maintenance, provisioning, and troubleshooting.



The hardware design of the system and its versions (POTS, ATM, ADSL/VDSL, PON) are explained, along with optional LET/RST and TR-8, TR-57, & GR-303 configurations, including connections to existing Class 5 switching systems. Various options are explained, including the different types of customer POTS plug-ins, T1, DS3, and ADSL/VDSL. Key concepts like TDM switching, copper and optical transport, and host-remote are explained, plus newer services like FTTP and OLT/ONTs are introduced. Transaction Language 1 (TL1), Craft Interface GUI, Panorama, and other input-output options are shown. Common maintenance functions like checking alarms, air filters, and backups are discussed, along with more advanced troubleshooting procedures for card-level repair, and for analysis of host T1 links with EOC/TMC channels. Other AccessMAX equipment is also reviewed, including DMAX, EMAX, as well as UMC variants within the Multiservice Access Platform (MSAP) series, including the multiple types of RSC cabinets. Fundamentals of telecom copper and fiber networks is also provided, to help the student understand the many ways of connecting to the equipment, and to understand its many features.

Symptom investigation and troubleshooting are demonstrated using previous trouble examples, and through actual troubles which may exist in the network. Common fault types and best practices are also presented, to help prevent troubles from occurring in the first place. In addition to supporting independent problem-solving skills, the course helps provide an excellent background for NOC and TAC interaction.

Our non-intrusive exercises equip the student to conduct day-to-day maintenance activities and show how to perform troubleshooting procedures, including aspects of problem isolation, cabling and port/card provisioning, which helps prepare students for higher-tier support interaction. The course is flexible, allowing the most important content for a particular group of students to be emphasized, and to allow for emphasis on the particular MSAP/UMC1000 platform(s) in use.

## Students Will Learn

- **Switching Fundamentals including ATM & SONET**
- **TDM-to-GR-303 Interfaces**
- **MSAP/UMC1000 Theory of Operation**
- **Plug-in Types & Differences**
- **System Access via CUI, LAN or Panorama**
- **How to use commands in Craft Interface and TL1**
- **Use and understand AFC & Tellabs documentation**
- **Basic provisioning of cards and transceiver ports**
- **How to find the physical location of a fault**
- **How to change cards**
- **How to backup configuration files & restore the system**
- **Troubleshooting by previous examples**
- **And much more...**

## Target Audience

Technical staff such as Central Office Technicians, combo-techs, and those responsible for the maintenance and troubleshooting of switching systems, plus NOC/SCC personnel who must respond to alarms. No previous background is required, although some familiarity with CO or switching equipment would be beneficial. Management and provisioning personnel will also benefit, providing a greater understanding of the resources needed for the system, and how to support it.

## Prerequisites

A basic understanding of telecommunications and networking principles is helpful due to the accelerated nature of the course. Any of our BTS switching courses such as TDM Switching Fundamentals Course are available for students with little or no previous telecom background.

## Course Outline

### Module 1 : Switching Fundamentals

- Optical Safety
  - Laser Power Levels & Class System
  - Visible & Non-Visible Wavelengths
- T&R, E&M, 2/4/8 Wire Circuits, Battery
- Electrical vs. Optical Power
- Decibels
  - logarithmic scale
  - copper & optical measurements

Digital: A/D & D/A Conversion

Time Division Multiplexing (TDM)

- Pulse Code Modulation (PCM)
- Frequency Division Multiplexing (FDM)
- Time Division Multiplexing (TDM)

- Carriers & Protocols
  - Triple-Play Services
  - Line Coding & Transmission Protocols
  - DS0, DS1, DS3
  - OC-x, STS, STM
  - AE, GPON
  - SIP, VoIP
  - Telcordia GR-303, GR-57, GR-08
- Carrier Signal Comparison
- Interconnections
  - UTP, Coax, Fiber
  - MMF, SMF
  - Connectors (SC, LC, etc.) & Transceivers (SFP, QFP, etc.)
- IP Networking Overview
  - OSI Model
  - TCP/IP
  - LAN, VLAN
  - Servers: DHCP, DNS, NTP, FTP, TFTP
- A Converged PSTN

#### Module 2 : UMC1000 Theory of Operation

- TDM Switching Theory
  - Host-Remote, COT/RT
  - GR-303 Remotes
  - EOC & TMC Links
  - POTS, ADSL/VDSL, FTTP
- UMC1000-series Platforms
  - Standard POTS LET w/RST Options
  - ATM Circuits
  - ADSL, VDSL Services
  - Fiber Optic Interfaces (PON OLT/ONT)
- Hardware Modules:
  - Processors: CPU-2, CPU-3, DLP
  - Transceivers: T1, T1-HDSL, T1 Async, OC-3, OC-12
  - Shelf: EBC, PSU, Fans, Rectifiers
  - Access: IPMI, CPU, GbE22x
  - Service: L-POTS, R-POTS, UVG, IP-POTS, HD R-POTS, ADSL, PON
  - Timing: ETI, BITS, T1 Derived
- System Features
- End-to-End Network Call

#### Module 3 : System Access

- I/O Ports
  - CPU, GbE
  - IP Access (IPMI)
- Access Methods
  - Craft User Interface (CUI)
  - Panorama Element Management System
  - TL1 CLI
- CUI Commands
  - Login, Logout, Version
  - Equipment Inventory
  - Status & Trouble

- Panorama Commands
  - Login, Logout, User Accounts
  - Initial Views, Menu Options
- FTP, SFTP, TFTP
  - File transfer & authentication servers
  - Software loads & AUP

#### Module 4 : Commands

- OS & Command Structure
- Craft User Interface Menu
  - Navigation Menu, Capabilities
  - Provisioning
  - Maintenance
  - Testing
  - Traffic
  - Administration
  - All Current Alarms
  - Help, Shortcut Keys
- Sample CLI Commands
  - Login, Alarms, Status, Provisioning, etc.
- TL1 Commands
  - TL1 Reference
  - login, alarms, status, provisioning, backup, etc.
- Panorama INM (EMS/NMS)
  - Sample GUI commands

#### Module 5 : Documentation

- Document Types, Numbering & Revisions
- MSAP/UMC1000 Documents
  - 0600 Series (AFC)
  - 76 Series (Tellabs)
  - Ordering Guides
    - Installation Guides - general, shelf-specific
    - Product Data Sheets & Application Notes
    - FSBs/CUS Docs
    - Third-Party Documents (SFP, cables, host switch)
- Tellabs Website

#### Module 6 : Administration & Maintenance

- System Back-up
  - AUP Program, Panorama
- System Status
  - LED Status, GUI
  - Status & Alarms (List Current, History)
- Drop Testing
  - OSP Measurements
- Loopbacks
  - System Loops, Hard Loops
- Plug-in Replacement
  - Part Numbering root, suffix
  - CLEI/HECI
  - Module Replacement Procedures (Maintenance & Testing docs)

- Power, POTS examples
- Configuration & Provisioning
  - Plug-in discovery
  - Configuration - POTS card, XCVRs
  - Configuration - shelf attributes
- System Backup
  - Database Save, Restore (Panorama GUI, CUI)
- Software Upgrades
  - Automatic Upgrade Program
  - System vs. Plug-in Upgrade

#### Module 7 : Troubleshooting

- NOC/SCC Interaction, ESD Precautions
- Tools & Resources
  - Troubleshooting Documents
  - Tools: TDR/OTDR, Power Meters
- Alarms & Faults
  - Alarm Information (GUI, CLI) & LEDs
  - Alarm Mappings: Plug-in Fails, Config Mismatch, Database, Errors, Power, etc.
  - SFP & Cabling - reflections, bend radius, abrasion
- Troubleshooting:
  - Alarm Clearing
  - Traffic Monitoring
  - Plug-in change
- System Logs
- Fault Clearing Strategy
  - Alarm Symptoms
  - Locating Procedures: CO or Customer side, LET or RST
  - EOC, TMC link errors
- Troubleshooting Examples
  - CPU Restart & Recovery
  - Bad transceiver
  - Provisioning/Activation Issues
  - Student Examples

#### Module 8 : Translations Introduction

- Modifying the Database
  - Listing & Modifying
- Cross-Connects
  - TR-57 COT/RT
  - GR-303 Groups, DLP & T1 Spans
  - CRVs
- Transceiver Settings
  - T1, FO, OC-3, OC-12

## Notes

The course runs in a 5 day format, but can be combined or integrated with other topics like TDM Switching courses for a full end-to-end training program.

The course is designed to run in either a Live Instructor-Led Virtual Classroom or In-Person Classroom setting. Virtual Field Trips can be added to allow students an opportunity to see and understand where all the parts of the system are found, what they do, and provide a better end-to-end understanding of the system.

## **Delivery Method**

LIVE Virtual Instructor-led with a flexible approach that adjusts content most relevant to students. Includes various non-intrusive labs, demonstrations, and exercises to help students focus on and retain the material presented.

## **Equipment Requirements**

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

Students must have Virtual and/or remote-access to an MSAP/UMC1000 system for this training.

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