

## TECHNICAL TRAINING

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### CTR8500/8300 Installation, Operation and Maintenance (CE/Layer 2)

TRN-WW-CTR85X83XL2-01

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#### Course Specifics



Duration:	3 days
Class capacity:	10 students
Location(s) for open enrollment:	San Antonio, TX, USA Hamilton, Scotland, UK Lagos, Nigeria
Materials provided:	Instruction and user Manuals (USB) Student Handbook (e-Book) Datasheets (USB)

#### Course Description

The CTR 8500/8300 is the industry's first microwave router. It is a fully integrated microwave networking solution, delivering a unique combination of high capacity all-packet transport, Carrier Ethernet, IP/MPLS and PWE services and comprehensive mission critical microwave features. The CTR is purpose-built for microwave, enabling operators to prepare for the all-IP future.

The **CTR8500/8300 Installation, Operation and Maintenance CE/Layer 2 course** teaches students key functions of the CTR8500/8300 platform and Carrier Ethernet (CE) software features. The course includes an overview of all available modules and the chassis, initial setup, install and login, basic configuration with the CLI, system commissioning, configuration, diagnostics, maintenance and troubleshooting. Extensive hands-on labs (nearly 50% of the course duration) and case studies offer students with scenarios they will face in real deployments in their networks.

Courses are conducted by AVIAT expert trainers in a mentoring environment backed by their deep technology expertise and experience in implementation of microwave wireless and IP networks.

The CTR8540 Installation, Operation and Maintenance course is conducted at the Aviat Training locations or can be arranged at customer sites.

#### Target Audience

This course is intended for installation and service personnel responsible for installation, configuration, test and maintenance procedures for the CTR8500/8300 product.

#### Objectives

Upon successfully completing this course, participants will be able to perform:

- Basic installation and configuration of CTR8500/8300 equipment
- Configuration of features such as Management, RF Links, Ethernet VLANs, QoS, and Link Aggregation
- Basic diagnostics, troubleshooting and preventive maintenance for CTR8500/8300

# TECHNICAL TRAINING

## Prerequisites

1. Participants must complete CTR System Overview E-Learning course.
2. Participants should have a basic understanding of Microwave and IP Fundamentals and have basic computer skills.
3. Each student must bring an IBM compatible laptop PC or an equivalent and have administrator rights on the PC.

The PC must have minimum parameters of:

- Pentium 4 or later w/ 1GB of RAM and 250 Mb of free hard drive space
- Microsoft Windows XP, Vista, Windows 7, or Windows 8
- USB Port
- Network card (LAN Port)
- DB9 serial port connection or adapter

## Course Outline

### System Overview

- CTR8540 Platform Base Hardware Highlights
- System Architecture and signal flow
- Chassis and modular cards overview – RACx2, POE x2, PWR
- CTR8311/8312 Platform Hardware Highlights

### Modular Cards and Radio Options

- Features and capabilities of the RAC cards – adaptive modulation, G.8262 compliance, and link aggregation support.
- Features and capabilities of the POE cards – support for WTM3x00 ODR series.
- ODU600 support with CTR RAC x2 – Capacity, Modulation and Channel Bandwidth combinations, protection configurations, adaptive modulation
- ODRs –WTM3200/3205, WTM3300 support with CTR POE x2 cards – capacity, modulation and channel bandwidth combinations

### Network Management and Initial Setup

- CLI Management via Serial and Ethernet
- CTR Portal Web based GUI Management
- In-band management and out-of-band Management
- SNMP
- Provisioning slots for optional cards – RAC, POE, PWR
- Provisioning RF Links
- Provisioning ports on Ethernet and TDM interfaces
- Provisioning with Scripts

### Deployment Scenarios

- Edge Applications
- Nodal Applications
- Aggregation Applications
- Inter and Intra RAC/ODU Protection and Configuration
- Cabling to Cell Site Routers for traffic and Management
- RF Link Provisioning Scripts

## TECHNICAL TRAINING

### VLAN and Ethernet QoS Configuration

- Port Based VLANs
- VLAN Tagging and Trunking (IEEE 802.1Q)
- Provider Bridging (IEEE 802.1ad)
- Ethernet QoS and Congestion Management
- QoS implementation – Classifier, Scheduling, Policing
- QoS mapping (IEEE 802.1p, DSCP)

### Performance Statistics and Monitoring

- RF Link Performance Statistics and Monitoring using CLI and GUI
- Ethernet Performance Statistics and Monitoring using CLI and GUI
- System Sensors
- RFC2544 Ethernet tests and interpretation

### Carrier Ethernet Features

- Layer 1 Link Aggregation
- 2+0, 4+0, and XPIC Configuration
- Layer 2 Link Aggregation
- Synchronization (ITU-T G.8262, G.8264, TDM Clock)
- Ethernet OAM (IEEE 802.ah, IEEE 802.1ag, ITU-T Y.1731)
- Ethernet Ring Protection Switching based on Y.1731 and 802.1ag
- TDM Pseudowire Transport and Configuration

### Troubleshooting and Maintenance

- Troubleshooting Overview
- Troubleshooting Techniques and Options
- Troubleshooting Configuration and Link (RF and Ethernet) Problems
- Maintenance Overview
- Troubleshooting Path Problems
- Fault Analysis and Reporting
- License and Software Management
- Configuration Management
- RAC and ODU Replacement

# TECHNICAL TRAINING

## Required Equipment for Training Sessions at Customer Sites

### RADIO

One equipment rack with 48VDC power supply (note; all CTR8540 equipment is positive earth)

At least 1 Traffic free hop – 2 radios talking to each other. (Path has been simulated with at least 60dB of attenuation, for troubleshooting training variable attenuators are preferred however not mandatory)

Chassis configurations should include as a minimum:

- RAC card (optional depending on Network Deployment and Configuration) with RAC jumper cable and 50ohm cable or M/M N-type adapters to connect to ODU.
- PoE cards (optional depending on Network Deployment and Configuration) with shielded CAT6 cable to connect to ODR
- SD cards with relevant licenses based on Network Deployment and Configuration
- ODUs should be a matching pair that is same sub band and TR spacing with one being Tx High and the other Tx Lo.
- ODRs should be a matching pair that is same sub band and TR spacing with one being Tx High and the other Tx Lo.

### OTHER EQUIPMENT

Ethernet tester  
Digital Multimeter

### CLASSROOM SET UP

Sufficient in size to handle all participants, instructor, desks, chairs, classroom equipment. The room must have sufficient AC power and air conditioning to operate equipment.

#### Classroom Equipment

Marker board, projector and screen,

#### Desk and Chairs

Desks or workstations with enough room for each student to write have open books, client PC and / or , keyboard and monitor

## Pricing

Please contact your Aviat local sales team for a quote or email [aviatcareeducate@aviatnet.com](mailto:aviatcareeducate@aviatnet.com)

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|---------------------------|--|
| ▪ TRN-WW-CTR85X83XL2-01A  | CTR8500-8300 I, M & O Course (3-days) Open Enrollment.           |
| ▪ TRN-WW- CTR85X83XL2-01B | CTR8500-8300 I, M & O Course (3-days) at Aviat.                  |
| ▪ TRN-WW-CTR85X83XL2-01C  | CTR8500-8300 I, M & O Course (3-days) at customer site.          |
| ▪ TRN-WW-CTR85X83XL2-01D  | CTR8500-8300 I, M & O Course (3-days) at customer site with DEMO |



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