EDUCATION SERVICES

CTR8540/830xx Installation, Operation and Maintenance

TRN-CTR8583-IOML2-A/B/C/D

Course Specifics

Duration: 3 days

Class capacity: 10 students

Materials provided: Student Handbook (e-Book), Datasheets

Course Description

The CTR 8540/83xx 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 microwaves, enabling operators to prepare for the all-IP future.

The **CTR8540/83xx Installation, Operation, and Maintenance course** teaches students key functions of the CTR8540/83xx platform. The course includes an overview of all available modules and the chassis, initial setup, installation and login, basic configuration with the CLI and GUI, system commissioning, configuration, diagnostics, maintenance, and troubleshooting. Extensive hands-on labs (nearly 50% of the course duration) and case studies offer students 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 the implementation of microwave wireless and IP networks.

The CTR8540/83xx 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 CTR8540/83xx product.

Prerequisites

- Participants must complete the CTR8540/83xx System Overview E-Learning course.

- Participants should have a basic understanding of Microwave and IP Fundamentals and have basic computer skills.

- Each student must bring a laptop PC and must have administrator rights on the PC with the following minimum specifications:

    o   Pentium 4 or later w/ 1GB of RAM and 250 MB of free hard drive space

    o   Microsoft Windows 7, 8, or 10 and Google Chrome as web browser

    o   USB Port / LAN Port / and DB9 serial port connections or adapter

Objectives

Upon completing this course, participants will be able to perform:
- Basic installation and configuration of CTR8500/8300 equipment
- Provisioning of features such as Management, RF Links, Ethernet VLANs, QoS, and Link Aggregation
- Basic diagnostics, troubleshooting, and preventive maintenance for the CTR8500/8300 radio

Course Outline

System Overview

- CTR 8500/8300 Features Overview

VLAN Configuration (CLI and GUI)

- VLAN Tagging and Trunking (IEEE 802.1Q)

- CTR8540 System Architecture
- Chassis and modular cards overview – RACx1/RACx2, PoEx2, PWR
- CTR8311/8312 platform highlights
- RF Options – IRU600v3/v4, ODU600v1/v2, ODU600T
- OBU and OCU
- ODU Part Numbers
- ODU Polarization
- Modulation, Capacity, System Gain

Network Management

- CLI Management via Serial and Ethernet
- CTR Portal web-based GUI Management
- In-band management and out-of-band Management
- Changing Management Access
- Script Loading
- SNMP
- Useful CLI commands
- Resetting to Factory Default

Radio Link Configuration

- RAC and ODU Configurations
- Connection to the CTR via Portal
- Connection to the CTR via Telnet
- Provisioning slots for plugin cards
- Configuring RF Links via GUI
- Configuring RF Links via CLI
- Radio Link Protection

PoE Configuration

- PoE card Features
- PoE Configuration via GUI
- PoE Configuration via CLI
- CLI Verification Commands

Deployment Scenarios

- Device Applications - Edge, Nodal, Pre-Aggregation, Aggregation
- Radio Link Deployment: 1+0, 1+1, 2+0, 2+0 XPIC, 4+0
- Inter and Intra RAC/ODU Protection Configuration

- Port-Based VLANs
- VLAN Bridging
- Transparent Bridge Mode
- Provider Bridging (Q-in-Q/IEEE 802.1ad)
- Provider Edge Mode
- VLAN Tunneling

Ethernet QoS

- Ethernet QoS Mechanisms
- QoS Prioritization
- QoS Implementation – Classification, Scheduling
- QoS mapping (IEEE 802.1p, DSCP)

Link Aggregation

- Layer 1 Link Aggregation
- L1LA on CTR
- L1LA Configuration

Maintenance

- ODU Maintenance
- Preventative Maintenance
- Software Management
- License Management
- Configuration Management

Troubleshooting and Maintenance

- Radio Link Diagnostics
- Sensors
- Link Performance
- Performance History
- Interface Statistics
- MAC Address Table
- Troubleshooting Basics for CTR
- Path Problems
- Receive Alarms

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

Synchronization

- Synchronization Capabilities
- Synchronization States
- Synchronization Configuration

TDM Transport

- Pseudowire Concept
- Pseudowire Types
- Pseudowire Configuration
- Tributary Diagnostics

Required Equipment for Training Sessions at Customer Sites

EDUCATION SERVICES

RADIO	One equipment rack with 48VDC power supply (Note: All CTR8500/8300 equipment is positive earth.)
	At least 1 radio link set up - 2 radios talking to each other. The path must have at least 60dB of attenuation. (For troubleshooting, variable attenuators are preferred but not mandatory.)
	Each CTR chassis should include as a minimum:
	•SD Card with relevant feature licenses
	•RACx1 or RACx2 plugins
	•Any relevant optional cards - PoE, PWR (PoE cards with shielded CAT6 cable to connect to ODU)
	•Appropriate traffic cables / Electrical/Optical SFPs (Optional)
	For the ODU:
	•50-ohm N-type IF cable for RAC-ODU connection
	•Radio cables, attenuators, and transitions (WG-coax adapters)
	•ODUs should be a matching pair, i.e., same sub-band and TR spacing with one being Tx High and the other Tx Low
OTHER EQUIPMENT	Ethernet tester, Digital Multimeter
CLASSROOM SET UP	Sufficient in size to handle all participants, desks, chairs, and classroom equipment. The room must have enough 110/220 AC power and air conditioning to operate all necessary equipment, including students' laptops.

Classroom Equipment
Multimedia projector and screen
Whiteboard and markers

Desk and Chairs
Desks or workstations with enough room for each student's laptop and training materials

Internet Access
Strong Wi-Fi connection

Pricing & Scheduling

Please contact your Aviat local sales team for a quote or email aviatcareeducate@aviatnet.com and request pricing for the following items:

TRN-CTR8583-IOML2-A	CTR 8540/ 8300: Installation, Operation and Maintenance, Layer 2 - ILT, 3 DAYS, Aviat Training Center - Open Enrollment -per Student
TRN-CTR8583-IOML2-B	CTR 8540/ 8300: Installation, Operation and Maintenance, Layer 2 - ILT, 3 DAYS, Aviat Training Center- 10 Students Max
TRN-CTR8583-IOML2-C	CTR 8540/ 8300: Installation, Operation and Maintenance, Layer 2 - ILT, 3 DAYS, Customer Location- 10 Students Max
TRN-CTR8583-IOML2-D	CTR 8540/ 8300: Installation, Operation and Maintenance, Layer 2 - ILT, 3 DAYS, Customer Location-with Equipment- only for US- 10 Students Max