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## RedCONNEX Product Support Certification Program

### Redline Certified Support Professional (RCSP) – AN30e Course Description

#### Course name:

AN-30e Operation, Installation Commissioning and Maintenance (AN-30e OICM)

#### Objective:

The AN-30e OICM certification course consists of 7 modules focusing on enabling the attendees acquire the following abilities through the 3-days of hands-on training:

- Understand the working of the AN-30e as an Ethernet Wireless Bridge for IP and TDM traffic
- Understand the technologies enabling the AN-30e deliver 72 Mbps of over the air at a range of over 60 miles while ensuring a BER level of 1E-09 (PER of 1E-06) and less than 10 ms latency for TDM and VoIP traffic streams
- Understand how the AN-30e OFDM engine eliminates multipath and overcomes selective frequency fading, in LOS, OLOS and NLOS deployments to carry TDM and IP traffic simultaneously.
- Understand how the AN-30e can prioritize TDM traffic over the air as compared to the IP traffic ingress at its data port.
- Understand how the AN-30e uses dynamic adaptive modulation and dynamic TDD when it carries IP only or IP and less time sensitive traffic loaded onto its TDM ports.
- Understand the AN-30e operation and working at the Ethernet, MAC, PHY and RF stages.
- Learn how AN-30e encapsulates TDM traffic in an Ethernet packet.
- Understand how AN-30e manages TDM traffic between TDM sources such PBX end to end.
- Learn how to configure AN-30e for most reliable transmission of E-1/T-1 traffic.
- Understand how AN-30e manages jitter and timing variations for end to end TDM traffic flow.
- Learn in hands on setup the configuration of AN-30e to carry full and fractional E-1/T-1 using Redline's TDM over Ethernet encapsulation technology.

#### Certification Criteria:

In order to receive the certification, students must pass the RCSP-AN-30e certification exam

**Course Duration:** 2 days

#### Target Audience:

The target audience for this workshop includes Network Administrators, Installers, system analysts, product support groups.

#### Delivery format:

This course is Instructor-Led or Self-Paced-Learning for students with RCSP-AN-30e certification. The instructor-led class will have hands-on training.

**Registration Code:** RCSP-30e-2

## **Pre-requisite Knowledge Requirement:**

- The OSI network model, TCP/IP protocol suite, working of routers, bridges.
- The Transmit and Receive path of a digital communications system, Digital modulation schemes such as BPSK, QPSK, QAM, digital communications systems performance parameters such as BER, PER, Latency
- Radio Frequency (RF) Systems: Basic understanding of RF signal propagation as a function of signal frequency, path loss models, fading models, frequency selective nature of the wireless channel, channel delay spread and Doppler effect

## **RSCP-AN50e Course Content Details**

This course consists of 6 modules described below. The modular nature of the course makes it possible to customize the content to address learning requirements of different category of customer employees such as network administrators, System Engineers, technical managers, Installers, Field Support personnel and technicians

### **Module-1: AN-30e Overview, Application and Deployment**

This module provides general information on Redline as a company, defines AN-30e. The module discusses in detail the foundation technologies of the AN-30e such as OFDM and dynamic TDD, explain the various differentiators of the products, discusses link configurations, AN-30e applications deployment in various networks. Typical field examples of AN-30e deployment to carry IP and TDM simultaneously are reviewed.

### **Module-2: AN-30e Wireless Module Building Blocks, Config and Performance parameters**

This module covers in a very detailed hands-on set up the AN-30e system elements, installation, configuration, management and performance tuning. This module provides for hands on training on interference source identification and mitigation techniques, RF link design using the link budget tool, software upgrade, grounding procedures and deployment rules are discussed in hands on setup.

### **Module- 3: AN-30e TDM Module Operation, Config and Performance Parameters**

This module reviews the basics of TDM transmission systems and introduces the concepts of transporting TDM traffic on packet networks. The process of encapsulating TDM directly into an Ethernet frame is discussed and compared with the TDMoIP technology in the context of network latency and jitter variation implications.

This module covers in hands on and systematic method the details the AN-30e TDM configuration for a number of applications scenarios such TDM only traffic on AN-30e and the mix of TDM and IP. System configuration concepts such TDM bundles, synchronization, jitter management are explained and configured for min BER and min jitter TDM transmission over the AN-30e wireless link. Product limitations and typical parameter settings are highlighted.

### **Module-4: RedAccess(NMS for AN-50e/AN-30e)**

This module covers the RedAccess capabilities to manage the AN-30e network elements. The module focuses on Node and network discovery, performance monitoring and Faults and Alarms reporting, network security administration and software upgrade procedure.

### **Module-5: RedCare Services**

This module covers the RedCare Premium Service, RedCare Enhanced Service, RedCare Basic Service. Customer care and system problem escalation process and the use of the RedCare Tool to open tickets, generate temporary option keys and get access to important product documentation are explained.

### **Module-6: Fault Simulation, Troubleshooting and Performance Validation**

This module is the hands on part of the RCSP-AN-30e course. Well known system fault scenarios are simulated; common field-found faults are inflicted on the system and get the students trouble shoot it. Students are provided an opportunity to apply their learning from the training and exercise product performance validation exercises.

During the execution of the exercises and hands-on work in this module, students performance is monitored and the student is found not performing to the desired level will not be allowed to take the RCSP-AN-30e exam..

## **More Information**

For further information on training and certification, please contact the Redline Training Department at [training@redlinecommunications.com](mailto:training@redlinecommunications.com).

## **About Redline Communications**

Redline Communications is the leading provider of standards-based wireless broadband solutions. Redline's WiMAX Forum Certified™ systems and award-winning backhaul and transport products enable service providers and other network operators to cost-effectively deliver high-bandwidth services including voice, video and data communications. Redline is committed to maintaining its wireless industry leadership with the continued development of WiMAX and other advanced wireless broadband products. With more than 30,000 installations in 75 countries, and a global network of over 100 partners, Redline's experience and expertise helps service providers, enterprises and government organizations roll out the services and applications that drive their business forward. For more information, visit [www.redlinecommunications.com](http://www.redlinecommunications.com).