

# W-CDMA, HSDPA & LTE RF Measurements Training Course

## W-CDMA, HSDPA & LTE Measurements on BTS Master™ (MT8221B MT8222A MT8222B) & Cell Master™ (MT8212E and MT8213E)

This intense two-day, instructor-led training focuses on cell site and base station measurements. Reduce operating costs by enhancing employee skills.

### Learn By Doing

Understand theory and perform hands-on measurements at the same time. Paired participants use BTS Masters to make measurements of instructor-generated or over-the-air signals throughout the class, including during lectures. *Applicable instruments: MT8222A, MT8222B, MT8221B, MT8212E and MT8213E.*

### Thorough Emphasis

Perform all the typical BTS measurements including Line Sweeping, RF Power Meter measurements, Interference Analysis, Spectrum Analysis, Channel Scanning, W-CDMA Code Domain measurements and LTE measurements. GSM/GPRS/EDGE Measurements are included in the appendix, and *can* be covered by the instructor, but only by special request.

### Cost Savings & Convenience

Eliminate or significantly reduce your travel expenses because training sessions are offered at a location close to you, or even at your location.

### Schedule

Training sessions are easily scheduled months in advance. Get details on class location, including discount information, OR having dedicated training at your site!

### Contact Us Directly

#### Email

[us-training@anritsu.com](mailto:us-training@anritsu.com)

#### Register on-line at

[www.us.anritsu.com/training](http://www.us.anritsu.com/training)

### Who Should Attend?

- Cell Technicians
- System Performance Engineers/Field Engineers
- Base Station OEMs
- Site Managers
- BTS Installers

# Yes! Sign Up Now for W-CDMA/HSDPA/LTE Training...

## You Will Learn

- Line Sweeping Principals
- Return Loss, DTF (Distance-To-Fault), Two Port Gain/Loss Transmission Measurements (for TMAs, Duplexers and repeater antenna isolation testing)
- Spectrum Analysis Basics, how to use a spectrum analyzer, identifying signal types, common measurements such as Occupied Bandwidth, ACLR and Channel Power
- General RF theory
- Interference Analysis
- Spectrograms, Signal Strength and RSSI
- Power Meter Measurements
- Channel Scanner Measurements
- W-CDMA Measurements such as Code Domain Power measurement of parameters such as CPICH, PICH and PSCH, Code Domain Error, EVM, Pilot Pollution, Ec/Io, Occupied Bandwidth, Adjacent Channel Leakage Ratio and Carrier Frequency Error
- LTE Measurements such as Resource Blocks, Spectral Emission Masks, Constellation evaluation, EVM (Error Vector Magnitude), Control Channel Power, Freq. Error, Occupied Band Width, LTE Scanner Signal to Noise Ratio and Dominance, Mapping and LTE Pass/Fail Testing

## What You Get

- Course Manual
- Certificate of Completion

## Course Fees (call for pricing)

W-CDMA/LTE Base Station Measurement Course (at Anritsu specified location)

W-CDMA/LTE Base Station Measurement Course (at your location)

## Course Outline

### Day 1

#### **Lecture 1**

- Introduction

#### **Lecture 2**

- Cable Analyzer
- Line Sweeping, Calibration, Return Loss, DTF and two port Measurements

#### **Lecture 3**

- Spectrum Analyzer
- Frequency, Span, Amplitude Detection and Offset settings, Resolution and Video Bandwidths, Markers, Limits, Trace Functions, Field Measurements (OBW, ACPR, Chan Power, Demod) and Coverage Mapping

### **Lab 1**

- Spectrum Analyzer
- Familiarization, Functions,
- Advanced Measurements,
- Measurements of Analog and Digital Signals

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## Day 1

### Lecture 4

- Power Meter
- Frequency and Amplitude Setup, Power Offset, Averaging and Limit Settings

### Lecture 5

- Interference Analysis
- Using Spectrogram, Signal Strength Meter, RSSI and Interference Mapping effectively

### Lecture 6

- Channel Scanner
- Channel based vs. Frequency Based settings, Custom Lists, Display Settings, Max Hold Lines

### Lecture 7

- GPS
- Activating GPS function, Verifying Lock, Confirming Reference Accuracy Boost

## Day 2

### Lecture 8

- W-CDMA Theory and Measurements
- Codes, QPSK and QAM Modulation, EVM,  $E_c/I_o$ ,  $E_b/N_o$ , SC, OVSF, Processing Gain, Code Domain Power

### Lecture 9

- HSDPA Theory and measurements
- HSDPA Code Domain Power and  $E_c/I_o$ , Constellation vs SNR, ACLR, Emission Mask, OTA (Over-The-Air measurements) Pilot Search, W-CDMA Pass/Fail Test

## Day 2

### Lecture 10

- LTE Theory and Measurements
- LTE's OFDM approach, Bit Rate per LTE Carrier, Grouping Subcarriers into Resource Blocks, LTE Spectrum Allotments, RB Time factor, LTE Symbols and Sub Frames, LTE Constellations (QPSK vs. 16QAM vs. 64QAM), LTE Measurements (RB Power, Scanner, TX Test, Mapping, LTE Pass/Fail)

For the most recent training schedule visit [www.anritsu.com/training](http://www.anritsu.com/training)

#### SALES CENTERS:

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