5G NR Signaling Parameters and the Applications in UXM eLearning Program

Get the best education quickly from trusted 5G experts

eLearning Program Overview

We offer a robust set of eLearning modules to help you find success with your Keysight investment at your own pace.

What you will learn

Build a strong foundation in 5G NR signaling and get the most productivity and value from your Keysight UXM 5G instrument and 5G Network Emulation Solutions.

This course will help users of the E7515B UXM 5G gain a deep understanding of the 5G signaling process and ASN parameters used in the UXM 5G Test Application. It will also help non-UXM 5G engineers understand the 5G signaling process and how higher layer signaling assigns physical layer resources. You will learn:

- Complete 5G NR call flows for SA/NSA, mobility, and carrier aggregation
- Key signaling messages and ASN parameters involved in each of the sub-processes
- Signaling parameters that are involved during cell search (MIB/SIBs), RACH, RRC setup, and RRC reconfiguration
- Use cases for UXM 5G pertaining to frequency settings and scheduling
New included topics

- The Transmission Configuration Indicator (TCI) configuration, which helps the UE to quickly decode the Physical Downlink Control Channel (PDCCH) or the Physical Downlink Shared Channel (PDSCH) using quasi-collocated signals
- The Sounding Reference Signal (SRS) configuration used by the gNB for channel quality estimation and synchronization
- Enabling the Uplink Control Information (UCI) on the Physical Uplink Shared Channel (PUSCH) to multiplex the UCI with data on the PUSCH
- Dynamic Spectrum Sharing (DSS), which enables deployment of both 4G LTE and 5G NR in the same frequency band and dynamically allocates spectrum resources based on user demand
- Channel State Information-Reference Signal (CSI-RS) use cases including channel measurement, beam management, and beam tracking
- The CSI-RS configuration focused on resource mapping
- The maximum throughput test, one of the key benchmarks for UE performance

Who should attend

5G wireless engineers and technicians who work with advanced device test.

- Prior understanding of 5G Systems and NR Fundamentals is preferred
- Users of Keysight UXM 5G NR test applications or other Keysight Network Emulation Solutions are preferred

Delivery method

Self-paced eLearning modules developed by Keysight experts.
# 5G NR Signaling Parameter and the Applications in UXM eLearning Program

T6601A-100 e-learning 5G NR Signaling Bundle - English

## eLearning Module

<table>
<thead>
<tr>
<th>eLearning Module</th>
<th>What you will learn</th>
<th>Duration</th>
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</table>
| Introduction to 5G NR Call flows | Non-Standalone 5G call flow  
Standalone 5G call flow  
5G Mobility and Carrier Aggregation Procedure | 1 hour   |
| Synchronization and System Information Acquisition | Synchronization and System Information Acquisition  
Overview  
PSS and SSS Synchronization  
Decoding the MIB in the PBCH  
Locating SIB1 using the MIB Parameters  
Decoding SIB1 to Acquire System Information. | 1.5 hours |
| Random Access Procedure | Random Access Configuration Parameters  
Random Access Response (Msg2)  
Contention Resolution During a Random-Access Procedure | 1 hour   |
| RRC Setup and Reconfiguration in NSA Mode - Part 1 | NR RRC Setup and Reconfiguration Process in NSA mode  
Bandwidth Part (BWP) Configuration  
PDCCH CORESET Configuration  
PDCCH Searchspace Configuration  
PUCCH Configuration  
SRS Configuration | 1.5 hours |
| RRC Setup and Reconfiguration in NSA Mode - Part 2 | PDSCH Configuration Parameters  
PUSCH Configuration Parameters  
Dynamic Spectrum Sharing (DSS)  
HARQ Parameters | 1.5 hours |
| RRC Setup and Reconfiguration in SA Mode | RRC Connection Overview  
RRC Setup  
NR Measurement Procedure  
Intra-NR Mobility  
Carrier Aggregation | 1.5 hours |
| Radio Link Failure | Radio Link Failure and Key RRC Parameters  
RRC Re-establishment and Key Parameters | 0.5 hours |
| Use Case Analysis - UXM 5G Test Application | Use Case: Frequency settings  
Use Case: NR scheduling  
Use Case: Maximum Throughput Test | 2 hours   |
Next step

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