

Dual Transfer Mode (DTM) ***Detailed System Operation***

Course Duration:

- ▶ 1 day

Course Description:

- ▶ This course addresses the needs of engineers and technicians who are already experienced in GSM and GPRS or EGPRS and need to obtain detailed information about the DTM.

Pre-Requisites:

- ▶ Good understanding of GSM and GPRS/EGPRS. If required, we advise our courses “GSM – Design Details and System Engineering” and our course “GPRS from A-Z” or “GPRS – Signaling & Protocol Analysis (RAN and MS)” to be taken in advance.
- ▶ Previous experience with GSM/GPRS network and / or mobile station design is favorable.

Course Target:

- ▶ The student will obtain an inside view on the constraints to implement and add the DTM to existing networks and mobile stations.
- ▶ After the course the student will have a clear view about how DTM operates and where the hurdles and obstacles are for the design and implementation.

Some of your questions that will be answered:

- ▶ What are the differences between DTM, Class A and Class B?
- ▶ What changes are necessary in the network to integrate DTM?
- ▶ What impact does DTM have on legacy mobile stations?
- ▶ Which operation modes does DTM support?
- ▶ How is handover performed by a DTM mobile station with both services operating?

Who should attend this class?

- ▶ Everybody who requires a detailed technical understanding of DTM.
- ▶ Design and Test Engineers of DTM-enabled (E)GPRS mobile stations.

Table of Contents:

An Introduction to DTM and other Mobile Station Operation Modes

Mobile Station Classes

- ⇒ Mobile Station Class C
- ⇒ Mobile Station Class B
- ⇒ Mobile Station Class A
- ⇒ Operation Modes of the Mobile Station
- ⇒ Summary and Conclusions

Important Aspects of the Dedicated Operation Mode

- ⇒ Power Control (Uplink and Downlink)
- ⇒ TA (Timing Advance) Control
- ⇒ Measurement Reporting
- ⇒ Mobility Management
- ⇒ Processing of Measurement Reports, Timing Advance- and Power Control Information

Important Aspects of Packet Operation Mode

- ⇒ Measurement Reporting
- ⇒ Power Control (Uplink and Downlink)
- ⇒ TA (Timing Advance) Control
- ⇒ Mobility Management
- ⇒ Overview UL-TBF-Establishment and Release

Introduction to DTM

- ⇒ The Different Operation Modes with DTM
- ⇒ State Transitions of the Mobile Station with DTM
 - RR-Idle/Packet-Idle ⇔ Packet Transfer Mode
 - RR-Idle/Packet-Idle ⇔ RR-Dedicated Mode
 - RR-Dedicated Mode ⇔ DTM
 - RR-Dedicated Mode ⇔ Packet Transfer Mode

Details of DTM Operation

The Shared Use Operation Mode

- ⇒ Details of the Shared Use Operation Mode (Uplink Direction)
- ⇒ Uplink Direction
- ⇒ Format of the GPRS_INFO-Message
- ⇒ Constraints on the PDU-Sizes
 - Max. Size of the LLC-PDU
 - Max. Number of LAPDm-Frames

Max. Number of Information Octets per LAPDm-frame
Consequences

- ⇒ Shared Use Operation Mode (Downlink Direction)
- ⇒ MS in GMM-Ready State
- ⇒ MS in GMM-Standby State
- ⇒ Summary and Conclusions

The Single Slot Operation Mode

- ⇒ Details of the Single Slot Operation Mode
- ⇒ PDCH/H + TCH/H – Configuration
- ⇒ Example for the Single Slot Operation Mode
- ⇒ Summary and Conclusions

Multislot Operation Mode

- ⇒ Reviewing the realistic Multislot Classes
 - Multislot Class Type
 - Sum RX + TX
 - T(ta)
 - T(tb)
 - T(ra)
 - T(rb)
- ⇒ Different Multislot Classes in DTM Rel. 99, Rel. 4 and Rel. 5
 - Release 99
 - Release 4
- ⇒ Details of the Multislot Operation Mode

DTM specific Conflicts of CS and PS Operation

- ⇒ Paging Coordination through Gs-Interface
- ⇒ Location Management
- ⇒ Encryption in Shared Use Operation Mode
- ⇒ Timing Advance Control and Measurement Reporting
- ⇒ Power Control

Details of BSS-based Paging Coordination

- ⇒ Option 1: MS in Dedicated Mode / Incoming Data Packets
- ⇒ Option 2: MS in Packet Transfer Mode / Incoming Call

Selected DTM-specific Procedures

(1) New Message Types with DTM

- ⇒ RR-Protocol (Radio Resource Control) and GTTP (GPRS Transparent Transport Protocol)
 - DTM_ASS_CMD
 - DTM_INFO
 - DTM_ASS_FAIL

DTM_REJ
DTM_REQ
GPRS_INFO
PACK_ASS
PACK_NOT

MS establishes PS-Data Transfer while CS-Call is Active (MO)

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

DL Packet Data while MS is involved in CS-Call / MS in Ready State

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

DL Packet Data while MS is involved in CS-Call / MS in Standby State

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

MS is paged during ongoing PS-Data Transfer

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

Routing Area Update while the MS is involved in CS-Call

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

Handover in Dual Transfer Mode

- ⇒ Initial Conditions
- ⇒ Applicability of this Procedure
- ⇒ Description

List of Acronyms
