

ETSI TS 144 005 V13.0.0 (2016-01)



**Digital cellular telecommunications system (Phase 2+);
Data Link (DL) Layer;
General aspects
(3GPP TS 44.005 version 13.0.0 Release 13)**



Reference

RTS/TSGG-0244005vd00

Keywords

GSM

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Foreword.....	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope	5
2 References	6
2a Concepts and terminology.....	7
3 Overview description of LAPDm functions and procedures	9
3.1 General	9
3.2 Unacknowledged operation	10
3.3 Acknowledged operation.....	10
3.4 Information transfer mode.....	11
3.4.1 Information transfer on the BCCH	11
3.4.2 Information transfer on the PCH + AGCH	11
3.4.3 Information transfer on the DCCHs.....	11
3.5 Release of data links.....	11
4 Service characteristics	11
4.1 General	11
4.2 Services provided to layer 3	11
4.2.1 General.....	11
4.2.2 Priority	12
4.2.3 Segmentation	12
4.2.4 Unacknowledged information transfer service	12
4.2.5 Acknowledged information transfer services	12
4.2.6 Random access procedure.....	14
4.3 Services required from the physical layer	14
4.4 Administrative services	15
4.4.1 General description of administrative services	15
4.4.2 Definition of primitives for administrative services	15
5 Overview of data link layer structure	15
5.1 Functional composition	15
5.2 Identification of data link end points.....	16
5.3 Data link procedure	16
5.4 Data link distribution procedure	16
5.5 Random access procedures.....	17
6 Specific requirements.....	17
6.1 Mode of operation and allowed SAPIs.....	17
6.2 Acknowledged mode of operation.....	18
6.2.1 Window size	18
6.2.2 Processing capacity.....	18
Annex A (informative): Change History	19
History	20

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document describes in general terms the Link Access Procedures on the Dm channel, LAPDm. The application of this protocol to other channel types is for further study. Details are provided in 3GPP TS 44.006.

The purpose of LAPDm is to convey information between layer 3 entities across the GSM PLMN radio interface (MS to network interface) using the Dm channel.

NOTE 1: The term Dm channel is used for convenience to designate the collection of all the various signalling channels required in the GSM system. See also 3GPP TS 44.003.

The definition of LAPDm is based on the principles and terminology of:

- ITU-T Recommendations X.200 and X.210: the reference model for Open Systems Interconnection (OSI);
- ITU-T Recommendations Q.920 and Q.921: the specification of LAPD for the user-network interface in ISDN;
- ITU-T Recommendation X.25 LAPB: user-network interface for packet mode terminals; and
- ISO/IEC 3309 and ISO 4335: High-level Data Link Control (HDLC) standards for frame structure and elements of procedures.

LAPDm is a protocol that operates at the data link layer of the OSI architecture. The relationship between the data link layer and other protocol layers is defined below.

NOTE 2: The interface between the mobile station and external terminal equipment/terminal adapters is defined in the Technical Specifications of the GSM 07-series.

NOTE 3: The physical layer on the radio interface is defined in 3GPP TS 44.004 and layer 3 is defined in 3GPP TS 24.007, 3GPP TS 44.018, 3GPP TS 24.010 and 3GPP TS 24.011. Reference should be made to these Technical Specifications for the complete definitions of the protocols and procedures across the GSM PLMN radio interface.

NOTE 4: The term "data link layer" is used in the main text of the present document. However, mainly in figures and tables, the terms "layer 2" and "L2" are used abbreviations. Furthermore, in accordance with 3GPP TS 24.007 and 3GPP TS 44.018 the term "layer 3" is used to indicate the layer above the data link layer.

LAPDm is independent of the transmission bit rate. It requires physical channels with characteristics as defined in 3GPP TS 44.003.

Clause 2 below describes basic concepts used in the present document and 3GPP TS 44.006.

Clause 3 gives an overview description of LAPDm functions and procedures.

Clause 4 summarizes the services that the data link layer provides to layer 3 and the services that the data link layer requires from the physical layer.

Clause 5 provides an overview of the data link layer structure.