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European digital cellular telecommunications system (Phase 2); Data Link (DL) layer; General aspects (GSM 04.05)

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS defines in general terms the data link layer (layer 2) of the Mobile Station (MS) - network interface within the European digital cellular telecommunications system (Phase 2).

This ETS correspond to GSM technical specification, GSM 04.05 version 4.0.3.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM Technical Specifications (GSM-TSs) (NOTE).

Reference is also made within this ETS to GSM 07.xx. series. The specifications in the series can be identified, with their full title, within the normative reference Clause of this ETS by the first two digits of their GSM reference number e.g. GSM 07.xx series, refers to GSM 07.01, GSM 07.02 etc.

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TS). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in GSM ETSs.

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1 General

1.1 Scope

This Technical Specification 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 TS GSM 04.06.

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: 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 TS GSM 04.03.

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

- CCITT Recommendations X.200 and X.210 : the reference model for Open Systems Interconnection (OSI);

- CCITT Recommendations Q.920 and Q.921 : the specification of LAPD for the user-network interface in ISDN;

- CCITT Recommendation X.25 LAPB : user-network interface for packet mode terminals; and

- ISO 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 1: The interface between the mobile station and external terminal equipment/terminal adapters is defined in the Technical Specifications of the GSM 07-series.

NOTE 2: The physical layer on the radio interface is defined in TS GSM 04.04 and layer 3 is defined in TS GSM 04.07, 04.08, 04.10 and 04.11. Reference should be made to these Technical Specifications for the complete definitions of the protocols and procedures across the GSM PLMN radio interface.

NOTE 3: The term "data link layer" is used in the main text of this Technical Specification. However, mainly in figures and tables, the terms "layer 2" and "L2" are used abbreviations. Furthermore, in accordance with TS GSM 04.07 and 04.08 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 TS GSM 04.03.

Section 2 below describes basic concepts used in this Technical Specification and TS GSM 04.06.

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

Section 4 summarises the services that the data link layer provides to layer 3 and the services that the data link layer requires from the physical layer.

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

1.2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] GSM 01.04 (ETR 100): "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".

[2] GSM 04.01 (prETS 300 550): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface General aspects and principles".

[3] GSM 04.03 (prETS 300 552): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".

[4] GSM 04.04 (prETS 300 553): "European digital cellular telecommunications system (Phase 2); Layer 1 General requirements".

[5] GSM 04.06 (prETS 300 555): "European digital cellular telecommunications system (Phase 2); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[6] GSM 04.07 (prETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".

[7] GSM 04.08 (prETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".

[8] GSM 04.10 (prETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".

[9] GSM 04.11 (prETS 300 559): "European digital cellular telecommunications system (Phase 2); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[10] GSM 07.01 (prETS 300 582): "European digital cellular telecommunications system (Phase 2); General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[11] GSM 07.02 (prETS 300 583): "European digital cellular telecommunications system (Phase 2); Terminal Adaptation Functions (TAF) for services using asynchronous bearer capabilities".

[12] GSM 07.03 (prETS 300 584): "European digital cellular telecommunications system (Phase 2); Terminal Adaptation Functions (TAF) for services using synchronous bearer capabilities".

[13] GSM 07.05 (prETS 300 585): "European digital cellular telecommunications system (Phase 2); Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[14] GSM 07.06 (prETS 300 586): "European digital cellular telecommunications system (Phase 2); Use of the V series Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface at the Mobile Station (MS) for Mobile Termination (MT) configuration".

[15] CCITT Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit - terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".

[16] CCITT Recommendation X.200: "Reference Model of Open Systems Interconnection for CCITT Applications".

[17] CCITT Recommendation X.210: "Open Systems Interconnection layer service definition conventions".

[18] CCITT Recommendation Q.920: "Integrated services digital network (ISDN) user-network interface - Data link layer General aspects".

[19] CCITT Recommendation Q.921: "Integrated services digital network (ISDN) user-network interface - Data link layer specification".

[20] ISO 3309: "Information technology - Telecommunications and information exchange between systems - High level data link control (HDLC) procedures - Frame structure".

[21] ISO/IEC 4335: "Information technology - Telecommunications and information exchange between systems - High level data link control (HDLC) procedures - Elements of procedures".

1.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04