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EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

STANDARD ECMA-105

PRIVATE TELECOMMUNICATION NETWORKS

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SIGNALLING AT THE S REFERENCE POINT

-

DATA LINK LAYER PROTOCOL

(PTN SSIG-L2)

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Brief History

This Standard is one of a series of ECMA standards defining services and signalling protocols applicable to Private Telecommunication Networks (PTNs). The series uses the ISDN concepts as developed by the ITU-TS and is also within the framework of standards for open systems interconnection as defined by ISO. It has been produced under ITSTC work item M-IT-05 4.2 for Bon de commande 75D.3/4.

The 1st Edition of this Standard, which was limited in scope to the attachment of Data Processing Equipment to Private Telecommunication Networks, was adopted by the ECMA General Assembly in June 1985.

To maintain alignment with results of the CCITT 1985-1988 Study Period, and to provide a true reflection of the agreed position of ECMA member companies, it was found necessary to publish a 2nd Edition of this Standard in December 1987.

A 3rd Edition was published in June 1990 to align with CCITT Rec. Q.921 Blue Book and changed, in format, to reference then-current work in ETSI in order to avoid large duplication of text. The scope was no longer limited to Data Processing Equipment.

This 4th Edition of the Standard now specifies the application of ETS 300 125 to the S reference point. It is intended to cover the period prior to the inclusion of this application in ETS 300 125.

Compared to the 3rd Edition of this Standard, various changes have been made in order to achieve alignment with I-ETS 300 169 (which is based on the 3rd Edition of ECMA-105 but modified during Public Enquiry and published by ETSI in December 1992).

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-TS, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

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1 Scope

This Standard specifies the characteristics of the data link layer protocol for use on the D-channel at the S reference point provided by a Private Telecommunication Network (PTN). The purpose of the data link layer protocol is to convey information between network layer entities using the D-channel.

This Standard is applicable to Terminal Equipment (TE) (including Terminal Adaptors) and Private Telecommunication Network Exchanges (PTNXs) interconnected at the S reference point.

2 Conformance

Conformance to this Standard by a TE or PTN implies that the requirements of subclauses 7.5 to 11.9 are met, with the exception that the following subclauses contain purely informative information:

- subclause 7.6 Overview of Data Link Layer Structure;
- subclause 10.2.3 Data Link - Data Link Layer Representation.

PTNs conforming to this Standard shall support automatic TEI assignment. A PTN may optionally support non-automatic TEI assignment.

Terminal Equipment conforming to this Standard shall support the procedures associated with either automatic, or non-automatic, TEI assignment.

NOTE 1

Only PTNs that support non automatic TEI assignment will be able to support TEs that support only non automatic TEI assignment.

3 References

ETS 300 125 Integrated Services Digital Network (ISDN); User-network interface data link layer specification; Application of CCITT Recommendations Q.920/I.440 and Q.921/I.441 (1991)

NOTE 2

In this Standard most subclauses refer to ETS 300 125 for their content. However, where ETS 300 125 refers to CCITT Recommendations I.430 or I.431 and to ETS 300 012 or ETS 300 011 respectively, only the reference to ETS 300 012 or ETS 300 011 shall apply.

ENV 41007-1 Definition of terms in private telecommunication networks, Part 1: Definition of general terms (1991)

4 Definitions

In addition to the definitions already given in ETS 300 125, the following definitions apply for the purpose of this Standard.

4.1 User

The Terminal Equipment (TE) attached to the Private Telecommunication Network (PTN) via the S reference point.

4.2 Network

The Private Telecommunication Network (PTN).

4.3 Network side

The part of the extension line and associated equipment on the PTN side of the S-interface including the data link layer entity in the PTN.

4.4 Private Telecommunication Network (PTN)

See ENV 41007-1.

4.5 User side

The part of the extension line which is between the S-interface and the TE, including the data link layer entity in the TE.

5 Acronyms

ASP	Assignment Source Point
CES	Connection Endpoint Suffix
DISC	Disconnect
DLCI	Data Link Connection Identifier
DM	Disconnected Mode
FCS	Frame Check Sequence
FRMR	FRaMe Reject
ISDN	Integrated Services Digital Network
N(R)	Receive Sequence Number
N(S)	Send Sequence Number
P/F	Poll/Final
PTN	Private Telecommunication Network
PTNX	Private Telecommunication Network Exchange
REJ	Reject
RNR	Receive Not Ready
RR	Receive Ready
S	Supervisory
SABME	Set Asynchronous Balanced Mode Extended
SAP	Service Access Point
SAPI	Service Access Point Identifier
TE	Terminal Equipment
TEI	Terminal Endpoint Identifier
U	Unnumbered
UA	Un-numbered Acknowledgement
UI	Unnumbered Information
V(A)	Acknowledge State Variable
V(R)	Receive State Variable
V(S)	Send State Variable
XID	eXchange IDentification

6 Concepts and terminology

Clause 2 of ETS 300 125, Part 1 shall apply.

7 Overview of LAPD functions and procedures

7.1 General

Subclause 3.1 of ETS 300 125, Part 1 shall apply.

7.2 Unacknowledged Operation

Subclause 3.2 of ETS 300 125, Part 1 shall apply.

7.3 Acknowledged Operation

Subclause 3.3 of ETS 300 125, Part 1 shall apply.

7.4 Establishment of information transfer mode

7.4.1 Data Link Connection Identification (DLCI)

Subclause 3.4.1 of ETS 300 125, Part 1 shall apply.

7.4.2 Data link states

Subclause 3.4.2 of ETS 300 125, Part 1 shall apply.

7.4.3 Terminal Endpoint Identifier (TEI) administration procedures

A TE in the TEI-unassigned state shall use the TEI assignment procedures to enter the TEI-assigned state. Conceptually, these procedures exist in the management entity. The TEI management function on the PTN side is referred to as the assignment source point in this Standard.

The purpose of this procedure is to allow:

- a TE to request the PTN to select a TEI value that the data link layer entities within the requesting TE will use in their subsequent communications;
- a TE to request the PTN to verify a TEI value that the data link layer entities within the requesting TE will use in their subsequent communications;
- a PTN to remove a previously assigned TEI value from a TE or all TEI values from all TEs;
- a PTN to check whether or not a TEI value is in use or whether multiple TEI assignments have occurred.

Additionally, the TE management entity should instruct the TE data link layer entity to remove a TEI value for its own internal reasons, for example losing the ability to communicate with the PTN on a no-power condition.

Since TEI assignment procedures may be of long duration, for better efficiency the TE should memorise for as long as possible the TEI value it has been allocated.

Typically, one TEI value would be used by the TE (i.e. for all the SAPs associated with the data link layer entity). If required, a number of TEI values may be requested by multiple use of the procedures defined in subclause 11.3.2. It shall be the responsibility of the TE to maintain the association between TEI, SAPI and Connection Endpoint Suffix (CES).

The actions taken by a data link layer entity to initiate these procedures on receipt of different primitives from layer 3, or from the physical layer, are defined in subclauses 10.2 and 11.3. Alternatively, the management entity may initiate these procedures for its own reasons.

7.4.4 Establishment of multiple frame operation

Subclause 3.4.4 of ETS 300 125, Part 1 shall apply.

7.5 Service characteristics

7.5.1 General

Subclause 4.1 of ETS 300 125, Part 1 shall apply.

7.5.2 Service provided to layer 3

Subclause 4.2 of ETS 300 125, Part 1 shall apply.

7.5.2.1 Unacknowledged information transfer service

Subclause 4.2.1 of ETS 300 125, Part 1 shall apply.

7.5.2.2 Acknowledged information transfer service

Subclause 4.2.2 of ETS 300 125, Part 1 shall apply.

7.5.2.3 Services provided to layer management

Subclause 4.3 of ETS 300 125, Part 1 shall apply.

7.5.2.4 Administrative services

Subclause 4.4 of ETS 300 125, Part 1 shall apply.

7.5.2.5 Summary of the data link service

Subclause 4.5.1 of ETS 300 125, Part 1 shall apply.

7.5.3 Services required from the physical layer

Subclause 4.6 of ETS 300 125, Part 1 shall apply.

NOTE 3

Procedures for physical layer reactivation are system management responsibilities and are therefore beyond the scope of this Standard.

7.6 Overview of data link layer structure

7.6.1 Data link procedure

Subclause 5.1 of ETS 300 125, Part 1 shall apply.

7.6.2 Multiplex procedure

Subclause 5.2 of ETS 300 125, Part 1 shall apply, with the following amendment:

The contention resolution procedures shall be based on the SAPI, giving priority to SAPI values with more leading zeros.

7.6.3 Structure of the data link procedure

Subclause 5.3 of ETS 300 125, Part 1 shall apply.

7.6.4 Management structure

Subclause 5.4 of ETS 300 125, Part 1 shall apply.

8 Frame structure for peer-to-peer communication

8.1 General

Subclause 2.1 of ETS 300 125, Part 2 shall apply.

8.2 Flag sequence

Subclause 2.2 of ETS 300 125, Part 2 shall apply.

8.3 Address field

The address field shall consist of two octets as illustrated in figure 1/Q.921 of ETS 300 125. The address field identifies the intended receiver of a command frame and the transmitter of a response frame. The format of the address field is defined in subclause 9.2 below.

8.4 Control field

Subclause 2.4 of ETS 300 125, Part 2 shall apply.

8.5 Information field

Subclause 2.5 of ETS 300 125, Part 2 shall apply.

8.6 Transparency

Subclause 2.6 of ETS 300 125, Part 2 shall apply.

8.7 Frame Check Sequence (FCS) field

Subclause 2.7 of ETS 300 125, Part 2 shall apply.

8.8 Format convention

8.8.1 Numbering convention

Subclause 2.8.1 of ETS 300 125, Part 2 shall apply.

8.8.2 Order of bit transmission

Subclause 2.8.2 of ETS 300 125, Part 2 shall apply.

8.8.3 Field mapping convention

Subclause 2.8.3 of ETS 300 125, Part 2 shall apply.

8.9 Invalid frames

Subclause 2.9 of ETS 300 125, Part 2 shall apply.

8.10 Frame abort

Subclause 2.10 of ETS 300 125, Part 2 shall apply.

NOTE 4

The use of frame abort is beyond the scope of this Standard.

9 Elements of procedures and formats for data link layer peer-to-peer communication

9.1 General

Subclause 3.1 of ETS 300 125, Part 2 shall apply.

9.2 Address field format

Subclause 3.2 of ETS 300 125, Part 2 shall apply.

9.3 Address field variables

9.3.1 Address field extension bit

Subclause 3.3.1 of ETS 300 125, Part 2 shall apply.

9.3.2 Command response field bit

Subclause 3.3.2 of ETS 300 125, Part 2 shall apply.

9.3.3 Service Access Point Identifier (SAPI)

Subclause 3.3.3 of ETS 300 125, Part 2 shall apply.

NOTE 5

The reservation of SAPI values for experimental purposes is beyond the scope of this Standard.

9.3.4 Terminal Endpoint Identifier (TEI)

Subclause 3.3.4 of ETS 300 125, Part 2 shall apply.

9.3.4.1 TEI for broadcast data link connection

Subclause 3.3.4.1 of ETS 300 125, Part 2 shall apply.

9.3.4.2 TEI for point-to-point data link connection

Subclause 3.3.4.2 of ETS 300 125, Part 2 shall apply.

9.4 Control field formats

Subclause 3.4 of ETS 300 125, Part 2 shall apply.

9.4.1 Information transfer (I) format

Subclause 3.4.1 of ETS 300 125, Part 2 shall apply.

9.4.2 Supervisory (S) format

Subclause 3.4.2 of ETS 300 125, Part 2 shall apply.

9.4.3 Unnumbered (U) format

Subclause 3.4.3 of ETS 300 125, Part 2 shall apply.

9.5 Control field parameters and associated state variables

Subclause 3.5 of ETS 300 125, Part 2 shall apply.

9.5.1 Poll/final (P/F) bit

Subclause 3.5.1 of ETS 300 125, Part 2 shall apply.

9.5.2 Multiple-frame operation - variables and sequence numbers

9.5.2.1 Modulus

Subclause 3.5.2.1 of ETS 300 125, Part 2 shall apply.

NOTE 6

Consideration must be given to the relational operators which determine the validity of these variables and numbers.

- 9.5.2.2 Send State Variable V(S)**
Subclause 3.5.2.2 of ETS 300 125, Part 2 shall apply.
- 9.5.2.3 Acknowledge state Variable V(A)**
Subclause 3.5.2.3 of ETS 300 125, Part 2 shall apply.
- 9.5.2.4 Send sequence Number N(S)**
Subclause 3.5.2.4 of ETS 300 125, Part 2 shall apply.
- 9.5.2.5 Receive state Variable V(R)**
Subclause 3.5.2.5 of ETS 300 125, Part 2 shall apply.
- 9.5.2.6 Receive sequence Number N(R)**
Subclause 3.5.2.6 of ETS 300 125, Part 2 shall apply.
- 9.5.3 Unacknowledged operation - variables and parameters**
Subclause 3.5.3 of ETS 300 125, Part 2 shall apply.
- 9.6 Frame types**
 - 9.6.1 Commands and responses**
Subclause 3.6.1 of ETS 300 125, Part 2 shall apply.
 - 9.6.2 Information (I) command**
Subclause 3.6.2 of ETS 300 125, Part 2 shall apply.
 - 9.6.3 Set Asynchronous Balanced Mode Extended (SABME) command**
Subclause 3.6.3 of ETS 300 125, Part 2 shall apply.
 - 9.6.4 Disconnect (DISC) command**
Subclause 3.6.4 of ETS 300 125, Part 2 shall apply.
 - 9.6.5 Unnumbered Information (UI) command**
Subclause 3.6.5 of ETS 300 125, Part 2 shall apply.
 - 9.6.6 Receive Ready (RR) command/response**
Subclause 3.6.6 of ETS 300 125, Part 2 shall apply.
 - 9.6.7 Reject (REJ) command/response**
Subclause 3.6.7 of ETS 300 125, Part 2 shall apply, with the following amendment:

A data link layer entity conforming to this Standard shall not send the REJECT command. It shall, however, be capable of receiving a REJECT command.
 - 9.6.8 Receive Not Ready (RNR) command/response**
Subclause 3.6.8 of ETS 300 125, Part 2 shall apply.
 - 9.6.9 Unnumbered Acknowledgement (UA) response**
Subclause 3.6.9 of ETS 300 125, Part 2 shall apply.
 - 9.6.10 Disconnected Mode (DM) response**
Subclause 3.6.10 of ETS 300 125, Part 2 shall apply.
 - 9.6.11 Frame Reject (FRMR) response**
Subclause 3.6.11 of ETS 300 125, Part 2 shall apply.

- 9.6.12 Exchange Identification (XID) command/response**
Subclause 3.6.12 of ETS 300 125, Part 2 shall apply.

10 Elements for layer-to-layer communication

10.1 General

Subclause 4.1 of ETS 300 125, Part 2 shall apply.

10.1.1 Primitive types

The primitive types are defined in clause 6.

10.1.2 Generic names

Subclause 4.1.1 of ETS 300 125, Part 2 shall apply, with the following amendment:

The MDL-XID primitive is not defined by this Standard. The group of management to layer 1 primitives is not defined by this Standard.

10.1.2.1 DL-establish

Subclause 4.1.1.1 of ETS 300 125, Part 2 shall apply, with the following addition:

The DL-Establish-REQUEST primitive is used by the layer 3 entity to cause a link to be established. The DL-ESTABLISH-CONFIRM primitive shall be returned in the case of success. In the case of unsolicited link establishment, the DL-ESTABLISH-INDICATION shall be used to inform the layer 3 entity.

10.1.2.2 DL-release

Subclause 4.1.1.2 of ETS 300 125, Part 2 shall apply, with the following addition:

The request is made by a DL-RELEASE-REQUEST and shall be acknowledged by a DL-RELEASE-CONFIRM. In the case of a data link layer malfunction, layer 3 may be notified by a DL-RELEASE-INDICATION primitive.

10.1.2.3 DL-data

Subclause 4.1.1.3 of ETS 300 125, Part 2 shall apply, with the following addition:

DL-DATA-Request is to be sent by the layer 3 entity whereas DL-DATA-INDICATION shall indicate to the layer 3 entity that a message has arrived over the line.

10.1.2.4 DL-unit-data

Subclause 4.1.1.4 of ETS 300 125, Part 2 shall apply, with the following addition:

The DL-UNIT-DATA-REQUEST primitive is used to transmit unacknowledged information and the DL-UNIT-DATA-INDICATION primitive shall be used to indicate reception of unacknowledged information.

10.1.2.5 MDL-assign

Subclause 4.1.1.5 of ETS 300 125, Part 2 shall apply.

10.1.2.6 MDL-remove

Subclause 4.1.1.6 of ETS 300 125, Part 2 shall apply.

10.1.2.7 MDL-error

Subclause 4.1.1.7 of ETS 300 125, Part 2 shall apply.

10.1.2.8 MDL-unit-data

Subclause 4.1.1.8 of ETS 300 125, Part 2 shall apply.

10.1.2.9 PH-data

Subclause 4.1.1.10 of ETS 300 125, Part 2 shall apply, with the following addition:

PH-DATA-REQUEST shall be sent by the data link entity to the physical layer; PH-DATA-INDICATION is sent in the opposite direction.

10.1.2.10 PH-activate

Subclause 4.1.1.11 of ETS 300 125, Part 2 shall apply.

10.1.2.11 PH-deactivate

Subclause 4.1.1.12 of ETS 300 125, Part 2 shall apply.

10.1.3 Parameter definition

Subclause 4.1.3 of ETS 300 125, Part 2 shall apply.

10.2 Primitive procedures

10.2.1 General

Subclause 4.2.1 of ETS 300 125, Part 2 shall apply.

10.2.2 Layer 3 - data link interactions

Subclause 4.2.2 of ETS 300 125, Part 2 shall apply.

10.2.3 Data link - data link layer representation

As indicated in subclause 7.4.2, the link establishment contains three basic states (excluding transient states): TEI-unassigned, TEI-assigned, and multiple-frame established. The state of the data link layer representation of the point-to-point data link connection is dependent on:

- layer 3 request primitives (DL-ESTABLISH-REQUEST and DL-RELEASE-REQUEST);
- peer-to-peer mode setting commands (SABME, DISC); and
- management function control commands (MDL-ASSIGN-REQUEST, MDL-REMOVE-REQUEST).

The information transfer capabilities are dependent on the particular state into which the data link has been placed by the above controls. The three states of a point-to-point data link and their transfer capabilities are:

- TEI Unassigned state;
- no peer-to-peer information transfer capability;
- TEI Assigned state.

Only unacknowledged information transfer using UI frames is possible. Layer 3 may request this service by using the DL-UNIT-DATA-REQUEST primitive and the layer 2 management entity may request this service by using the MDL-UNIT-DATA-REQUEST primitive.

Multiple-frame established state: two modes of information transfer are possible:

- i) unacknowledged information transfer using UI frames. Layer 3 may request this service by using the DL-UNIT-DATA-REQUEST primitive and the layer 2 management entity may request this service by using the MDL-UNIT-DATA-REQUEST primitive;
- ii) acknowledged information transfer mode using I frames. The layer 3 entity may request this service by using the DL-DATA-REQUEST primitive.

When a DL-ESTABLISH-REQUEST or DL-UNIT-DATA-REQUEST is received by the data link layer entity and the TEI is not assigned, a TEI assignment procedure is initiated by the data link layer prior to achieving the layer 3 request.

When a DL-ESTABLISH-REQUEST is made, the TEI assignment procedure will be followed by a link establishment.

When a DL-UNIT-DATA-REQUEST is made, transmission of UI frames will start as soon as the TEI assignment procedure is completed.

11 Definition of the peer-to-peer procedures of the data link layer

Clause 5 of ETS 300 125, Part 2 shall apply.

11.1 Procedure for the use of the P/F bit

11.1.1 Unacknowledged information transfer

Subclause 5.1.1 of ETS 300 125, Part 2 shall apply.

11.1.2 Acknowledged multiple-frame information transfer

A data link layer entity receiving a SABME, DISC, RR, RNR, REJ or I frame with the P bit set to ONE, shall set the F bit to ONE in the next response frame it transmits, as defined in table 1.

Table 1 - Immediate response operation of the P/F bit

Command received with P bit = ONE	Response transmitted with F bit = ONE
SABME, DISC	UA, DM
I, RR, RNR, REJ	RR, RNR, REJ

The F bit of a response frame shall be set equal to the P bit in a received invalid command frame.

The P bit shall always be set to ONE in all supervisory command frames. For those command frames the timer T200 should normally be running.

NOTE 7

In general, the P bit should not be set to ONE in the I frames. This allows greater link efficiency in that the I frames may be acknowledged via an N(R) transmitted by the peer entity in either an I frame (if the peer entity has an I frame available at the time an I frame is received from its peer) or, in a Supervisory (S) frame if no I frame is available (see subclause 11.4.2).

However, the P bit could be set to ONE in an I frame if a unique response via a supervisory frame is desired from the peer entity.

11.2 Procedures for unacknowledged information transfer

Subclause 5.2 of ETS 300 125, Part 2 shall apply.

11.3 Terminal Endpoint Identifier (TEI) management procedures

11.3.1 General

Subclause 5.3.1 of ETS 300 125, Part 2 shall apply.

NOTE 8

A formal description of TEI procedures is given in annex B.

11.3.2 TEI assignment procedure

Subclause 5.3.2 of ETS 300 125, Part 2 shall apply, with the following additions:

Additional item "d) Management entity identifier" shall apply in each of the three enumerated lists.

11.3.2.1 Expiry of T202

Subclause 5.3.2.1 of ETS 300 125, Part 2 shall apply.

NOTE 9

Once TEI assignment has been initiated, the data link layer entity receiving MDL-ERROR-RESPONSE shall discard all DL-UNIT-DATA-REQUEST primitives received earlier. The values of timers T202 and N202 are specified in subclause 11.9 below.

11.3.3 TEI check procedure

11.3.3.1 Use of the TEI check procedure

Subclause 5.3.3.1 of ETS 300 125, Part 2 shall apply.

11.3.3.2 Operation of the TEI check procedure

Subclause 5.3.3.2 of ETS 300 125, Part 2 shall apply, with the following additions:

Additional bullet item "c) Management entity identifier" shall apply in the first enumerated list.

Additional bullet item "d) Management entity identifier" shall apply in the second enumerated list.

11.3.4 TEI removal procedure

When the network side layer management entity determines that the removal of a TEI value is necessary (see subclause 11.3.4.2), the ASP shall transmit a message containing the following elements, and issue an MDL-REMOVE-REQUEST primitive:

- a) Message type = Identity remove;
- b) TEI value which is to be removed, as indicated in the Ai field (the value 127 indicates that all user equipment should remove their TEI values; otherwise, the specific TEI value should be removed);
- c) management entity identifier.

The identity remove message shall be sent twice in succession to overcome possible message loss.

When the TE layer management entity determines that the removal of a TEI value is necessary (see subclause 11.3.4.2), it shall instruct the data link layer entity to enter the TEI-unassigned state, using the MDL-REMOVE-REQUEST primitive. This action should also be taken for all TEI values when the Ai field contains the value of 127.

Further action to be taken shall be either initiation of automatic TEI assignment for a new TEI value or notification to the TE user of the need for corrective action (i.e. when equipment uses a non-automatic TEI value and does not support the automatic TEI assignment procedure).

A request to remove a non-existent TEI shall be ignored.

NOTE 10

In case the same TEI is used in combination with different SAPIs, the removal procedure will affect all DLCIs.

11.3.4.1 Action to be taken by the data link layer entity receiving MDL-remove-request

Subclause 5.3.4.1 of ETS 300 125, Part 2 shall apply.

11.3.4.2 Conditions for TEI removal

Subclause 5.3.4.2 of ETS 300 125, Part 2 shall apply, with the following amendment:

The use of "MPH-" primitives is not specified in this Standard.

11.3.5 Formats and codes

Subclause 5.3.6 of ETS 300 125, Part 2 shall apply with the following amendment:

The "Identity verify" message type in table 8/Q.921 of ETS 300 125, Part 2 is not specified in this Standard.

11.4 Procedures for establishment and release of multiple-frame operation

11.4.1 Establishment of multiple-frame operation

Subclause 5.5.1 of ETS 300 125, Part 2 shall apply.

11.4.2 Information transfer

Subclause 5.5.2 of ETS 300 125, Part 2 shall apply.

11.4.3 Termination of multiple-frame operation

Subclause 5.5.3 of ETS 300 125, Part 2 shall apply, with the following exception:

In the case of layer 1 de-activation initiated by the network system management, the data link layer entity shall discard all I queues and deliver to layer 3 a DL-RELEASE-CONFIRM primitive if a DL-RELEASE-REQUEST primitive is outstanding, or otherwise a DL-RELEASE-INDICATION primitive.

11.4.4 TEI-assigned state

Subclause 5.5.4 of ETS 300 125, Part 2 shall apply.

11.4.5 Collision of unnumbered commands and responses

Subclause 5.5.5 of ETS 300 125, Part 2 shall apply.

11.4.6 Unsolicited DM response and SABME or DISC command

Subclause 5.5.6 of ETS 300 125, Part 2 shall apply, with the exception of the sentence: "This is typically caused by a user equipment applying a protocol procedure according to X.25 LAPB [6] to ask for a mode-setting command".

11.5 Procedures for information transfer in multiple-frame operation

Subclause 5.6 of ETS 300 125, Part 2 shall apply.

11.6 Re-establishment of multiple-frame operation

Subclause 5.7 of ETS 300 125, Part 2 shall apply.

11.7 Exception condition reporting and recovery

Subclause 5.8 of ETS 300 125, Part 2 shall apply.

11.7.1 N(S) sequence error

Subclause 5.8.1 of ETS 300 125, Part 2 shall apply, with the following amendment:

The optional procedures defined in appendix I of ETS 300 125, Part 2, are not specified in this Standard.

11.7.2 N(R) sequence error

Subclause 5.8.2 of ETS 300 125, Part 2, shall apply.

11.7.3 Timer recovery condition

Subclause 5.8.3 of ETS 300 125, Part 2 shall apply.

11.7.4 Invalid frame condition

Subclause 5.8.4 of ETS 300 125, Part 2 shall apply.

11.7.5 Frame rejection condition

Subclause 5.8.5 of ETS 300 125, Part 2 shall apply.

11.7.6 Receipt of an FRMR response frame

Subclause 5.8.6 of ETS 300 125, Part 2 shall apply.

11.7.7 Unsolicited response frame

Subclause 5.8.7 of ETS 300 125, Part 2 shall apply.

11.7.8 Multiple assignment of a TEI value

Subclause 5.8.8 of ETS 300 125, Part 2 shall apply.

NOTE 11

The management entity may ultimately decide to remove the TEI; refer to appendix II of ETS 300 125, Part 2.

11.8 Data link layer monitor function

Subclause 5.10 of ETS 300 125, Part 2 shall apply.

11.9 List of system parameters

Subclause 5.9 of ETS 300 125, Part 2 shall apply, with the following amendments:

- timer T201 shall not be used at the TE side;
- timer T203 is defined as the "maximum time allowed in the multiple-frame established state without a frame being exchanged".

Annex A
(informative)

Occurrence of the MDL-ERROR-INDICATION primitive

Appendix II of ETS 300 125, Part 2 is applicable.

NOTE A.1

The user management action to be taken on "receipt of unsolicited response" and "unsuccessful (N200 times)" in table 11-1 of ETS 300 125, Part 2 is specified as "remove TEI" in this Standard. The "TEI identity verify procedure" option of ETS 300 125, is not supported.

Annex B
(informative)

SDL for point-to-point procedures

The example re-transmission diagrams shown in annex B of ETS 300 125, Part 2 is also relevant for this Standard, with the following exceptions:

- i) in figure B-7 (8 of 10) note 2, the procedures described in appendix I of ETS 300 125, Part 2, are not applicable to equipment conforming to this Standard.
- ii) in figure B-8 (7 of 9), note 2, the procedures described in appendix I of ETS 300 125, Part 2, are not applicable to equipment conforming to this Standard.

Annex C
(informative)

Re-transmission representation of the broadcast procedure

Annex C of ETS 300 125, Part 2 is applicable.

Annex D
(informative)

State transition tables for point to point procedures

The state transition tables given in annex D of ETS 300 125, Part 2 may also be used to provide additional clarification of the procedures described in this Standard.

In case of conflict between the state diagrams shown in annex D of ETS 300 125, Part 2 and the text of the normative clauses of this Standard, the latter shall take precedence over the former.

