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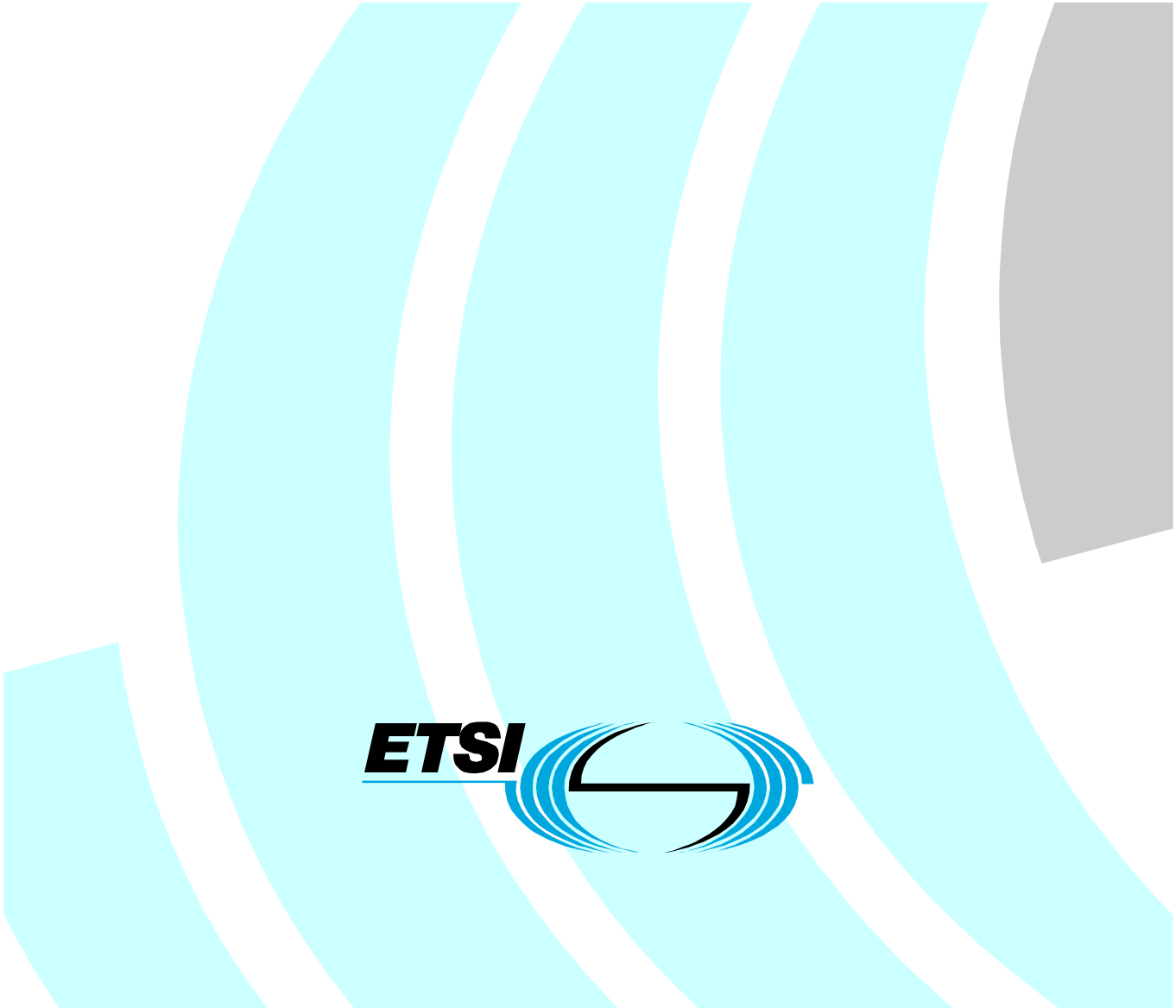
ETSI Guide

**Terminals' access to Public Telecommunications Networks;
Application of the Directive 1999/5/EC (R&TTE), article 4.2;
Guidelines for the publication of interface specifications;
Part 3: Digital wireline interfaces**



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Contents

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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Access and Terminals (AT).

The present document is part 3 of a multi-part deliverable covering Terminals' access to Public Telecommunications Networks; Application of the Directive 1999/5/EC (R&TTE), article 4.2; Guidelines for the publication of interface specifications, as identified below:

Part 1: "General and common aspects";

Part 2: "Analogue narrow-band wireline interfaces";

Part 3: "Digital wireline interfaces";

Part 4: "Broadband multimedia cable network interfaces".

Introduction

The Radio Equipment and Telecommunications Terminal Equipment (R&TTE) Directive 1999/5/EC [1] introduced a fundamental change in the area of terminal equipment interworking with the public telecommunications networks. Formerly there were specifications that applied to terminal equipment ensuring, to varying degrees of confidence, interworking with and via different networks.

As a consequence of the R&TTE Directive an obligation is placed on Public Network Operators (PNO) to publish specifications of network interfaces they provide to the end user, whatever is the connection of the end user with the PNO, direct or indirect. Consequently Public Service Providers (PSPs) such as Internet Service Providers (ISPs) should also publish their interface specifications.

Article 4.2 of the Directive states:

"*…Member States shall ensure that such operators publish accurate and adequate technical specifications of such interfaces before services provided through those interfaces are made publicly available, and regularly publish any updated specifications. The specifications shall be in sufficient detail to permit the design of telecommunications terminal equipment capable of utilizing all services provided through the corresponding interface. The specifications shall include, inter alia, all the information necessary to allow manufacturers to carry out, at their choice, the relevant tests for the essential requirements applicable to the telecommunications terminal equipment. Member States shall ensure that those specifications are made readily available by the operators.*"

The present document provides guidance on the content of such publications for the area of digital narrow band wired access to the public telecommunications network in order to meet this requirement. Documents for a similar purpose have been produced by ETSI covering the publication of other type of interfaces. They are at present being revised and integrated in this set of multipart deliverables.

The present document belongs to a multipart document (EG 201 730 series) where the parts have a common component of the title:

Terminals' access to Public Telecommunications Networks;

Application of the Directive 1999/5/EC (R&TTE), article 4.2;

Guidelines for the publication of interface specifications

Later new parts may be created and this will be reflected in the present document.

The present document was produced in the context of the integration of all ETSI deliverables published with the aim of facilitating the application of the R&TTE Directive, article 4.2, in a single consistent set of documents. It is also an update of the contents of:

ETSI TR 101 731: "Access and Terminals (AT); Digital access to the public telecommunications network; Publication of interface specification under Directive 1999/5/EC; Guidelines for describing digital interfaces".

NOTE: A more complete introductory text is offered in EG 201 730-1 [2].

1 Scope

The purpose of the present document is to assist the public network operators and public service providers in producing interface publications according to Article 4.2 of Directive 1999/5/EC [1].

The present document lists the characteristics of a non-radio digital interface to the public telecommunications network which could be necessary for a description of that interface but does not give guidance on the style of presentation of interface publications.

The present document is applicable to interface specifications for new, modified and existing interfaces.

NOTE: General aspects of the guidance on producing interface publications according to Article 4.2 of Directive 1999/5/EC [1] are offered on EG 201 730-1 [2]. The present document gives technology specific guidance. Technology specific guidance for the most common technologies is offered in other parts of this multipart deliverables..

Indirect access to services and networks are also covered in the present document. The timing and other administrative issues regarding the publication of the interface specifications are not covered in the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[2] ETSI EG 201 730-1: "Terminals' access to Public Telecommunications Networks; Application of the Directive 1999/5/EC (R&TTE), article 4.2; Guidelines for the publication of interface specifications; Part 1: General and common aspects".

[3] ITU-T Recommendation X.200 / ISO/IEC 7498-1 (1994): "Information technology - Open Systems Interconnection - Basic Reference Model: The basic model".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EG 201 730-1 [2] and the following apply:

direct access: access for terminal equipment to services provided by a PNO or PSP exclusively via the infrastructure of that PNO or PSP

indirect access: access for terminal equipment to services provided by a PNO or PSP via the infrastructure of another PNO or PSP

leased line: connection between two or more points that does not require the terminal to provide the network with information in order for the connection to be established

public telecommunications network: telecommunications network used to provide publicly available telecommunications services

structured: digital service offering in which the number of bits to a frame, the meaning of bits within certain frames, etc. is defined and agreed with the network operator

switched: connection normally between any two points that requires the terminal to provide the network with information in order for the connection to be established

unstructured: digital service offering in which the structure and content of the bit stream is not subject to any agreement with the network operator

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in EG 201 730-1 [2] and the following apply:

ISO	International Organization for Standardization
NTP	Network Termination Point
PNO	Public Network Operators
PSP	Public Service Providers
PTN	Public Telecommunications Network

4 Applicability of parameters to interface types.

The parameters described in the present document are applicable to various types of non-radio digital access to the public telecommunications network. Direct and indirect access to public telecommunications networks are described in clause 6.2 of EG 201 730-1 [2], where different positions of the interface in relation to the Network Termination equipment are also studied.

In all the scenarios the interface at the NTP, has to be published. In the scenarios for indirect access, the additional details also have to be published where these are required for terminal design and are not contained in the direct access interface publication.

4.1 Applicability of clauses to some particular interface types

Not all of the characteristics described in clause 5 are applicable to every network interface. Guidance on applicability may be found in table 1. Table 1 indicates which clauses of the present document are likely to be relevant to particular types of digital interfaces.

Table 1

		Network Interface Type		
		Leased		Switched
Clause No	**Clause title**	**Unstructured**	**Structured**	
7.1 of EG 201 730-1 [2]	General	✓	✓	✓
7.2 of EG 201 730-1 [2]	Safety	✓	✓	✓
7.3 of EG 201 730-1 [2]	EMC	✓	✓	✓
5.1	Physical characteristics	✓	✓	✓
5.2	Electrical characteristics	✓	✓	✓
5.3	Optical signal characteristics	X	✓	✓
5.4	Basic coding structure	X	X	✓
5.5	Protocol elements and procedures for signalling	X	X	✓
5.6	Additional features			✓ (see note)
Legend ✓ subject applies X subject does not apply				
NOTE: Depending on the implementations and services provided.				

5 Characteristics to be specified

5.1 Physical characteristics

5.1.1 Connection method

The mechanical characteristics of the network connection point should be described in sufficient detail as to allow a terminal manufacturer to design or select a connector or an adapter capable of reliably connecting the terminal at the NTP.

5.1.2 Connection pin assignment and wiring arrangements

Full details of connector pin assignment should be provided where plug/socket connectors are used at the NTP. Where the NTP is of the hardwired variety, details of cable type and connection arrangements should be provided.

5.1.3 Sizing constraints

Any characteristic that may limit the number of terminals that can be connected to the PTN interface should be specified. Examples of such characteristics are maximum power consumption and maximum bus loading.

5.2 Electrical Characteristics

5.2.1 Signal characteristics

Details of the electrical characteristics of the interface such as the range of transmission rates, the range of signal power accepted and delivered by the interface, pulse mask, line code, impedance, timing limitations, etc. should be provided.

5.2.2 Synchronization

Where the service provides a network source of synchronization or requires synchronization to the network for it to function, sufficient information should be provided to enable the designer to produce a terminal that can synchronize with the network.

5.2.3 Power feed conditions

Where power is provided over the interface, full details of the power arrangements should be given.

5.3 Optical signal Characteristics

5.3.1 Signal Characteristics

Details of the optical characteristics of the interface such as the range of transmission rates, the ranges of signal power and wavelength accepted and delivered by the interface, pulse mask, line code, timing limitations, etc. should be provided.

5.3.2 Synchronization

Where the service provides a network source of synchronization or requires synchronization to the network for it to function, sufficient information should be provided to enable the designer to produce a terminal that can synchronize with the network.

5.4 Basic Coding Structure

Details should include items such as state machine, bit stuffing, priority mechanisms and alarm reporting, etc.

5.5 Protocol elements and procedures for signalling

Where the Public Telecommunications Network uses a layered protocol architecture, the functions and characteristics of each layer that involves interaction between the terminal equipment and the Public Telecommunications Network should be specified.

As an example, for interfaces based on the Open Systems Interconnection Model [3] - characteristics of layers 1, 2 and 3 will need to be considered, although some characteristics within any specific layer may not be relevant for all types of interface. Where interaction between the terminal and the network is required above layer 3, characteristics of these higher layers will also need to be provided. A similar level of detail will need to be provided for interfaces not based on the ISO 7 layer model.

The PTN interface specification should include a list of all the telecommunication services provided through the PTN interface.

Protocol elements and procedures for establishing, maintaining, modifying and terminating communications should be detailed as well as the methodology for dealing with any unrecognized protocol data units or data elements.

Protocol elements might be code, frame format and size, messages, information elements, timers, window size, etc.

Details should be provided not only of the options that have been provided, but also any that have not.

5.6 Additional features

Not all interfaces will support all the following features.

5.6.1 Voice services

The coding algorithm used to digitize the speech should be detailed.

5.6.2 Charging information

Where charging information is applied or supplied by the network at the NTP, this should be specified.

Examples of charging information might be:

- start ;and/or
- end time;
- duration;
- charge rate;
- charge volume;
- etc.

5.6.3 "Supplementary" services and optional user facilities

Elements and procedures for the control of supplementary services and optional user facilities, where provided, should be detailed.

5.6.4 Presentation aspects

Any information related to specific text character presentation by the terminals during communication should be provided. This clause has particular relevance for Telex systems.

Annex A (informative): List of most useful standards

A.1 General

This clause can be used by the PNO as a source of information for the publication of the specifications of the publicly offered interfaces. In the particular case of the present document, since it is extremely difficult to foresee and list all interfaces that can beneficiate from the present guidance, this annex only refer for most commonly used standards.

Unless specific regulation states otherwise, a PNO may refer partly to one standard or to the standard as a whole. The PNO may also refer to a standard and indicate some specific points in addition or in replacement of some clauses or requirements in the standard.

In all the cases a short overview of the standards in this sector may be useful.

SR 002 211 (V1.1.1) offers an overview of a very large number of standards that might have impact in regulatory aspects. The interfaces offered to the user are also covered in that Special Report and the technologies covered by the present document were also considered. The usage of SR 002 211 may therefore be useful.

On the bibliography some more documents are cited.

A.2 ISDN basic access

EN 300 012-1, ETS 300 402-2 and ETS 300 403-1 are the standards commonly used for this type of interfaces.

A.3 ISDN primary rate access

EN 300 011-1, ETS 300 402-2 and ETS 300 403-1 are the standards commonly used for this type of interfaces.

A.4 Some ISDN based services interfaces to the user

The objective of EG 201 973 parts 1 and 3 is to reflect the wider European implementation of network characteristics supported by digital PSTN (ISDN) terminals. These contain recommendations intended as guidance for the definition and design of broadband IP networks and equipment (NGNs) supporting legacy terminals.

A.5 Digital leased lines

The following standards are commonly used in support of leased lines of the associated types:

Standard	Title
ETSI EN 300 288	Access and Terminals (AT); 64 kbit/s digital unrestricted leased line with octet integrity (D64U); Network interface presentation
ETSI EN 300 289	Access and Terminals (AT); 64 kbit/s digital unrestricted leased line with octet integrity (D64U); Connection characteristics
ETSI EN 300 418	Access and Terminals (AT); 2 048 kbit/s digital unstructured and structured leased lines (D2048U and D2048S); Network interface presentation
ETSI EN 300 247	Access and Terminals (AT); 2 048 kbit/s digital unstructured lease line (D2048U); Connection characteristics
ETSI EN 300 419	Access and Terminals (AT); 2 048 kbit/s digital structured leased lines (D2048S); Connection characteristics

Standard	Title
ETSI EN 300 766	Access and Terminals (AT); Multiple 64 kbit/s digital unrestricted leased lines with octet integrity presented at a structured 2 048 kbit/s interface at either or both ends (D64M); Connection characteristics and network interface presentation
ETSI EN 300 686	Access and Terminals (AT);34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U, D140S);Network interface presentation
ETSI EN 300 687	Access and Terminals (AT);34 Mbit/s digital leased lines (D34U and D34S);Connection characteristics
ETSI EN 300 688	Access and Terminals (AT); 140 Mbit/s digital leased lines (D140U and D140S); Connection characteristics
ETSI EN 301 164	Transmission and Multiplexing (TM);Synchronous Digital Hierarchy (SDH);SDH leased lines; Connection characteristics
ETSI EN 301 165	Transmission and Multiplexing (TM);Synchronous Digital Hierarchy (SDH);SDH leased lines; Network and terminal interface presentation

A.6 Optical interfaces

The most relevant ITU-T standards for optical interfaces parameters are ITU-T Recommendation G.957 in relation to SDH and G959.1 for physical aspects.

Annex B (informative): Bibliography

CEC decision 2002/C 331/04: "List of standards and/or specifications for electronic communications networks, services and associated facilities and services (interim issue)".

CEC decision 2003/548/EC: "List of standards and/or specifications for electronic communications networks, services and associated facilities and services".

ETSI SR 002 211 (V.1.1.1): "List of standards and/or specifications for electronic communications networks, services and associated facilities and services; in accordance with Article 17 of Directive 2002/21/EC".

ITU-T Recommendation G.957: "Optical interfaces for equipments and systems relating to the synchronous digital hierarchy".

ITU-T Recommendation G.959.1: "Optical transport network physical layer interfaces".

ETSI EG 201 973 (series): "Access and Terminals (AT); Public Switched Telephone Network; Support of legacy terminals by Broadband IP networks and equipment".

ETSI ES 202 122 (V1.1.1): "Access and Terminals (AT); Integrated Services Digital Network (ISDN); ISDN NT port on Terminal Equipment".

ETSI EN 300 052-1: "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 055-1: "Integrated Services Digital Network (ISDN); Terminal Portability (TP) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 058-1: "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 061-1: "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 064-1: "Integrated Services Digital Network (ISDN); Direct Dialling In (DDI) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 097-1: "Integrated Services Digital Network (ISDN); Connected Line Identification Presentation (COLP) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 141-1: "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 188-1: "Integrated Services Digital Network (ISDN); Three-Party (3PTY) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 207-1: "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI EN 300 286-1: "Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

ETSI ETS 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

ETSI EN 300 011-1: "Integrated Services Digital Network (ISDN); Primary rate user network interface (UNI). Layer 1 specification".

ETSI EN 300 012-1: "Integrated Services Digital Network (ISDN): Basic User network interface (UNI). Layer 1 specification".

ETSI ETS 300 402-2"Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".

ISO 10173: "Information technology - Integrated Services Digital Network (ISDN) Primary access connector at reference points S and T".

ISO 8877: "Connectors for Basic Access to the Integrated Services Digital Network Part 1 Specification for a Basic Access Interface connector and its contact assignments".

ITU-T Recommendation E.164: "The international public telecommunications numbering plan".

ITU-T Recommendation I.430: "Integrated Services Digital Network (ISDN). ISDN user network interfaces. Basic Rate user-network interface - Layer 1 Specification".

ITU-T Recommendation I.431:"Integrated Services Digital Network (ISDN). ISDN user network interfaces. Primary Rate user-network interface - Layer 1 Specification".

ETSI EN 300 288: "Access and Terminals (AT); 64 kbit/s digital unrestricted leased line with octet integrity (D64U); Network interface presentation".

ETSI EN 300 289: "Access and Terminals (AT); 64 kbit/s digital unrestricted leased line with octet integrity (D64U); Connection characteristics".

ETSI EN 300 418: "Access and Terminals (AT); 2 048 kbit/s digital unstructured and structured leased lines (D2048U and D2048S); Network interface presentation".

ETSI EN 300 247: "Access and Terminals (AT); 2 048 kbit/s digital unstructured lease line (D2048U); Connection characteristics".

ETSI EN 300 419: "Access and Terminals (AT); 2 048 kbit/s digital structured leased lines (D2048S); Connection characteristics".

ETSI EN 300 766: "Access and Terminals (AT); Multiple 64 kbit/s digital unrestricted leased lines with octet integrity presented at a structured 2 048 kbit/s interface at either or both ends (D64M); Connection characteristics and network interface presentation".

ETSI EN 300 686: "Access and Terminals (AT); 34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U, D140S); Network interface presentation".

ETSI EN 300 687: "Access and Terminals (AT); 34 Mbit/s digital leased lines (D34U and D34S); Connection characteristics".

ETSI EN 300 688: "Access and Terminals (AT); 140 Mbit/s digital leased lines (D140U and D140S); Connection characteristics".

ETSI EN 301 164: "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH); SDH leased lines; Connection characteristics".

ETSI EN 301 165: "Transmission and Multiplexing (TM); Synchronous Digital Hierarchy (SDH); SDH leased lines; Network and terminal interface presentation".

History

Document history		
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