INTERIM EUROPEAN TELECOMMUNICATION STANDARD

I-ETS 300 006

August 1991

Source: ETSI TC-BT

Reference: T/TE 10-04

ICS: 33.080

Key words: BT, PABX, transmission characteristics, digital interfaces

Business Telecommunications (BT); Transmission characteristics at digital interfaces of a digital Private Automatic Branch Exchange (PABX)

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

Contents

Blank page

1 Foreword

This Interim-European Telecommunication Standard (I-ETS) was produced by the Business Telecommunications (BT) Technical Committee of the European Telecommunications Standards Institute (ETSI), and was adopted, having passed through the ETSI standards approval procedure.

This Standard was first prepared in the format of a CEPT Recommendation and was later converted into an ETSI standard. Consequently, it does not fully conform to the guidelines for the structure of ETSI standards although the ETSI "stylesheet" has been applied.

This Standard was submitted for Public Enquiry as an ETS, but, as it contains transmission parameters without specifying the exact measurement method it was decided to convert the standard into an I-ETS, thus allowing a two year period during which the BT Technical Committee can gain further experience with a view to modifying the parameter values and finalising the test method.

This Standard is intended to be used as a specification for the design of digital PABXs and for the harmonization of PABX transmission parameters throughout Europe. Parameters which are only of an informative instead of a normative character are highlighted as such.

During its preparation this I-ETS has been circulated to other European Standardization bodies (European Computer Manufacturers Association (ECMA) and European Committee for Electrotechnical Standardization (CENELEC)) who are also involved in the preparation of European Standards on ISPBXs.

There are three other standards directly connected with this Standard:

I-ETS 300 003: Transmission characteristics of digital PABXs

I-ETS 300 004: Transmission characteristics at 2-wire analogue interfaces of a digital PABX.

I-ETS 300 005: Transmission characteristics at 4-wire analogue interfaces of a digital PABX.

This Standard is based on information from CCITT Recommendations and the relevant Recommendation numbers are quoted where appropriate.

2 Scope

This I-ETS provides characteristics for:

- digital interfaces (Type KD, LD and MD),
- input and output connections with digital interfaces,
- half-connections with digital interfaces,

in accordance with definitions in I-ETS 300 003, particularly in figure 1 and figure 3 of I-ETS 300 003.

Detailed transmission characteristics of the digital interface ports are given in section 5 of this I-ETS.

Section 5.3 covers the requirements for transmission characteristics of the half-connections between the digital interfaces and the PABX test points. The half-connection comprises an input connection (the one-way 64 kbit/s path from the interface to the test point) and an output connection (the one-way 64 kbit/s path from the test point to the interface) as defined in I-ETS 300 003. Requirements are given for the input connection and the output connection characteristics and the two are not necessarily identical.

The overall characteristics of a connection through the digital PABX involving two interfaces can be obtained by suitably combining the values for the characteristics of the two half-connections.

Where bit integrity is maintained on the digital half-connection and the error performance requirements are met, the digital half-connection will add no impairment to the voice-band performance of a complete connection through the switch (with the exception of delay). For this reason the digital half-connection requirements do not include the conventional voice band parameters.

(The cases where bit integrity is not maintained are not considered in this Standard).

3 Related standards

I-ETS 300 003 (1991): "Business Telecommunications (BT); Transmission characteristics of digital Private Automatic Branch Exchange (PABX)".

I-ETS 300 004 (1991): "Business Telecommunications (BT); Transmission characteristics at 2-wire analogue interfaces of a digital Private Automatic Branch Exchange (PABX)".

I-ETS 300 005 (1991): "Business Telecommunications (BT); Transmission characteristics at 4-wire analogue interfaces of a digital Private Automatic Branch Exchange (PABX)".

ETS 300 011: "Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles".

ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

NOTE: All references to CCITT Recommendations refer to the 1988 edition ("Blue Book") except if expressly otherwise noted.

CCITT Recommendation G.703: Physical/electrical characteristics of hierarchical digital interfaces.

CCITT Recommendation G.704: Synchronous frame structures used at primary and secondary hierarchical levels.

CCITT Recommendation G.714: Separate performance characteristics for the encoding and decoding sides of PCM channels applicable to 4-wire voice-frequency interfaces.

CCITT Recommendation I.430: Basic user-network interface - Layer 1 specification.

CCITT Recommendation I.431: Primary rate user-network interface - Layer 1 specification.

CCITT Recommendation Q.554: Transmission characteristics at digital interfaces of a digital exchange.

4 Definitions

This section covers requirements for interfaces KD, LD and MD. These interfaces are subdivided as follows :

KD1: basic access to the ISDN.

KD2: primary access to the ISDN.

KD3: non-ISDN interface to the public network. (see NOTE)

LD1: basic rate configuration for terminal equipment.

LD2: primary access configuration for terminal equipment.

LD3: non-ISDN interfaces for terminal equipment. (see NOTE)

MD1: basic access configuration for another PABX.

MD2: primary access configuration for another PABX.

MD3: non-ISDN interface for another PABX (under national competence). (NOTE: but some requirements are discussed in ETS 300 011).

NOTE: These interfaces must meet requirements for timing and synchronization which are outside the scope of this Standard.

Jitter and wander tolerance is the ability of the PABX to accept phase deviations on incoming signals without introducing slips or bit errors.

The jitter and wander tolerance at input KD2, LD2 and MD2 is defined in ETS 300 011 (CCITT Recommendation I.431).

For the ISDN-interfaces the location of interfaces 1a (user side) and 1b (network side) as defined in ETS 300 012 (CCITT Recommendation I.430) and ETS 300 011 (CCITT Recommendation I.431) must be taken into account.

The interfaces KD1 and KD2 are 1a interfaces. The interfaces LD1 and LD2 are 1b interfaces.

The nature of the MD1 and MD2 interfaces depends on the type of inter PABX line. If the PABXs are interconnected by ISDN access connection elements, the MD1 and MD2 interfaces are 1a interfaces. If the PABXs are interconnected by physical medium (loss µ 6 dB at 1024 Hz) the master PABX has 1b interfaces and the slave PABX has 1a interfaces.

5 Digital interfaces specifications

5.1 Physical and electrical characteristics of interfaces

NOTE 1: The characteristics of KD1 interfaces are given in ETS 300 012 (CCITT Recommendation I.430) and of KD2 in ETS 300 011 (CCITT Recommendation I.431). The characteristics of KD3 interfaces are given in CCITT Recommendations G.703 and G.704.

For the LD1 interface, ETS 300 012 and for the LD2 interface, ETS 300 011 (CCITT Recommendation I.431), shall be applied informative.

NOTE 2: The non-ISDN interface LD3 is outside the scope of this Standard.

The MD1 and MD2 interfaces for PABX interconnection may follow the ETSs for KD1 and KD2 interfaces.

NOTE: Specific requirements for this application are outside the scope of this Standard (see also Annex C to ETS 300 011 for MD2 interface). The characteristics of MD3 interfaces are given in CCITT Recommendations G.703 and G.704, but some general aspects and requirements are discussed also in Annex C to ETS 300 011.

5.2 Jitter and wander tolerance at the PABX interfaces

The jitter and wander tolerance at inputs KD1, MD1 and LD1 should comply with ETS 300 012 (CCITT Recommendation I.430). This is informative only.

For 1a interfaces the minimum tolerance to jitter and wander at input ports and the jitter and wander at output ports shall be as defined in ETS 300 011. The jitter and wander at 1b interfaces shall not exceed the values shown in ETS 300 011.

NOTE: For interworking 1b interfaces with 1b interfaces the jitter and wander at output ports must be lower than the tolerance of 1a interfaces at input ports.

The input ports of 1b interfaces must accept the jitter of 1a output ports.

5.3 Characteristics of 64 kbit/s half connections

NOTE: This section covers the essential digital characteristics of 64 kbit/s half connections. Where these requirements are met, the digital half connection will add no impairment to the voice band performance of a complete connection through the PABX (with the exception of delay). The voice band performance of digital half connections may therefore be interpreted by assuming that ideal send and receive sides (see CCITT Recommendation G.714) are connected to the digital inputs and outputs respectively. The digital half connection requirements also ensure that any connection through the PABX using a pair of digital half connections will provide acceptable performance for non-voice 64 kbit/s digital services.

5.3.1 Half connection characteristics common to all digital interfaces

5.3.1.1 Error performance

The long-term mean Bit Error Ratio (BER) for a single pass of a 64 kbit/s connection through a PABX between the digital interfaces should be 1 in 10^9 or better. This corresponds to 99,5% error-free minutes assuming that the occurrence of errors has a Poisson distribution. This is informative only.

5.3.1.2 Bit integrity

Bit integrity shall be maintained if called for by the ISDN signalling to support 64 kbit/s non-telephony services. This is informative only.

NOTE: It is understood that to meet this requirement, digital processing devices such as µ/A law converters, echo suppressors and digital pads must be disabled for non-telephony calls requiring bit integrity. The means of disabling these devices has yet to be determined. (See I-ETS 300 003, § 4.5.1.).

5.3.1.3 Bit sequence independence

No limitation shall be imposed by the PABX on the number of consecutive binary ones or zeros or any other binary pattern within the 64 kbit/s paths through the PABX. This is informative only.

5.3.1.4 Round trip delay

NOTE 1: The requirements for round trip delay are given in I-ETS 300 003, § 5.2.

NOTE 2: For ISDN-interfaces the term "signal transfer delay" is used. For transmission purposes, it is equivalent to "absolute group delay" when measured between analogue/digital conversion points.

History

Document history	
August 1991	First Edition
March 1996	Converted into Adobe Acrobat Portable Document Format (PDF)