Telecommunications Standards Advisory Committee (TSAC)

Technical Specification

Terminal Equipment connected to 2 Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Leased Lines

IDA TS DLCN
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Telecommunications Standards Advisory Committee (TSAC)

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Content

Technical Specification for Terminal Equipment connected to 2 Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Leased Lines

1 Scope

1.1 This Specification defines the network interface requirements for the following digital leased lines, based on relevant sections of the ITU-T Rec. G.703, and the ETSI EN 300 418 and EN 300 686:

(a) 2 Mbit/s digital leased line which provides a bi-directional point-to-point digital transmission capability with a usable bit rate of 2,048 kbit/s

(b) 34 Mbit/s digital leased line which provides a bi-directional point-to-point digital transmission capability with a usable bit rate of 34,368 kbit/s

(c) 140 Mbit/s digital leased line which provides a bi-directional point-to-point digital transmission capability with a usable bit rate of 139,264 kbit/s

1.2 It defines the network interface provided by the digital leased line for which establishment and release of connection between Network Termination Points (NTPs), as shown in scenario 2 in Figure 1 (Figure 3 of ETSI EG 201 730-1), do not require any protocol exchange at the NTP. Scenarios for wireless connection (air interfaces) are outside the scope of this Specification.

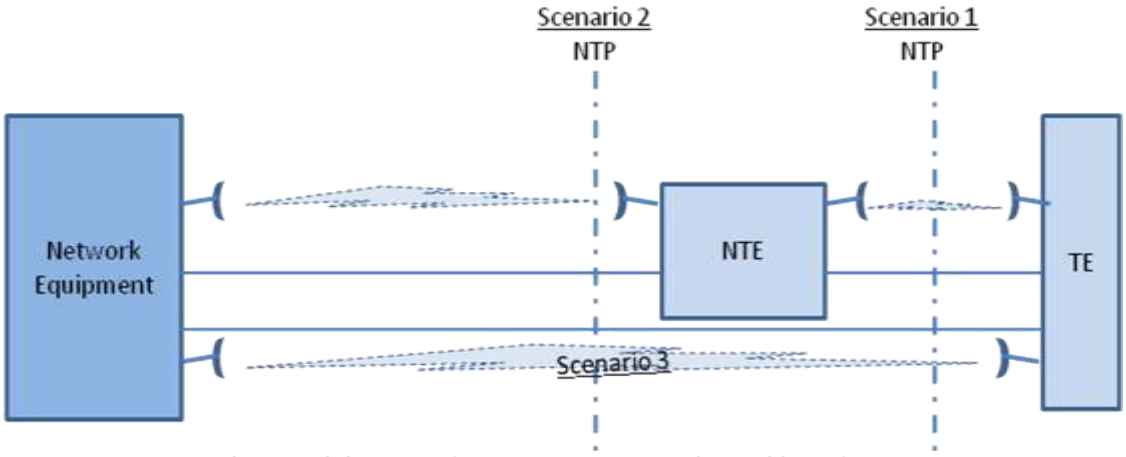

Figure 1 (Figure 3 of ETSI EG 201 730-1): Position of NTP

1.3 The provision of circuit timing and any structuring of data is the responsibility of the user.

1.4 For frame structures used in the hierarchical bit rate of 2,048 kbit/s, the basic frame structure and characteristics of frame structures carrying various bit rates in the 2,048 kbit/s interface, as defined in § 2.3 and § 5 of the ITU-T Rec. G.704, shall be applicable. The frame alignment and cyclic redundancy check relating to basic frame structure at 2,048 kbit/s, shall also be applicable.

1.5 For digital equipment which synchronises with an external 2,048 kHz synchronisation signal, requirements defined in § 13 of the ITU-T Rec. G.703, should be applicable.

2 General Requirements

2.1 Power Supply

2.1.1 The TE may be AC powered or DC powered. For AC powered equipment, the Specification shall be complied with when operating from an AC mains supply of voltage, 230V ± 10% and frequency, 50 Hz ± 2%. Where external power supply is used, e.g. AC adaptor, it shall not affect the capability of the equipment to meet the Specification.

2.2 Identification of Equipment

2.2.1 The TE shall be marked with the supplier or manufacturer's name or identification mark, and the supplier or manufacturer's model or type reference. The markings required shall be legible, indelible and readily visible.

2.3 Electromagnetic Compatibility (EMC) & Electrical Safety Requirements

2.3.1 The equipment shall comply with the EMC requirements defined in IEC CISPR 22.

2.3.2 The equipment shall be tested for compliance with the International Electrotechnical Commission IEC 60950-1 safety standard[1]. The requirements in IEC 60950-1 that are applicable to the equipment [e.g. class of equipment, type of telecommunication network voltage (TNV) circuit and types of components] shall be identified and complied with.

[1] The safety standard includes, among others, protection of telecommunications network service personnel and users of other equipment connected to the network from hazards in the equipment.

3 Electrical Characteristics of 2,048 kbit/s Interface

3.1 General Characteristics (§ 9.1, ITU-T Rec. G.703)

3.1.1 The nominal bit rate shall be 2,048 kbit/s, and accuracy shall be ± 50 ppm (±102.4 bit/s).

3.1.2 The signal transmitted at the output port shall comply with the High Density Bipolar code of order 3 (HDB3) encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex B of ETSI EN 300 418. The input port shall correctly decode HDB3 encoded signals without error in accordance with HDB3 encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex B of ETSI EN 300 418.

3.2 Specifications at the Output Ports (§ 9.2, ITU-T Rec. G.703)

3.2.1 The pulse at the output port shall comply with the requirements given in Table 7/G.703 and Figure 15/G.703 for 2,048 kbit/s digital leased lines using 120 Ω interfaces (Table 1, ETSI EN 300 418).

3.3 Specifications at the Input Ports (§ 9.3, ITU-T Rec. G.703)

3.3.1 The input return loss with respect to 120 Ω at the interface should be greater than or equal to the values given in § 9.3, ITU-T Rec. G.703 (Table 2, ETSI EN 300 418).

3.4 Grounding of outer conductor or screen (§ 9.4, ITU-T Rec. G.703)

3.4.1 The outer conductor of the coaxial pair shall be connected to the bonding network both at the input port and the output port.

4 Basic frame structure at 2,048 kbit/s

4.1 For frame structure at 2,048 kbit/s hierarchical level, the requirements specified in § 2.3 and § 5 of ITU-T Rec. G.704 shall be applicable.

5 Frame Alignment and Cyclic Redundancy Check (CRC) Procedures

5.1 For frame structure at 2,048 kbit/s hierarchical level, the requirements specified in § 4 of ITU-T Rec. G.706 for frame alignment and CRC procedures, relating to frame structure at 2,048 kbit/s, shall be applicable.

6 2,048 kbit/s Synchronisation Interface

6.1 The use of this interface, according to § 13 of ITU-T Rec. G.703, is recommended for all applications where it is required to synchronise a digital equipment by an external 2048 kHz synchronisation signal.

7 Electrical Characteristics of 34,368 kbit/s Interface

7.1 General Characteristics (§ 11.1, ITU-T Rec. G.703)

7.1.1 The nominal bit rate shall be 34,368 kbit/s, and accuracy shall be ± 20 ppm (±688 bit/s).

7.1.2 The signal transmitted at the output port shall comply with the High Density Bipolar code of order 3 (HDB3) encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex B of ETSI EN 300 686. The input port shall correctly decode HDB3 encoded signals without error in accordance with HDB3 encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex B of ETSI EN 300 686.

7.2 Specifications at the Output Ports (§ 11.2, ITU-T Rec. G.703)

7.2.1 The pulse at the output port shall comply with the requirements given in Table 9/G.703 and Figure 17/G.703 for 34,368 kbit/s digital leased lines (Table 1, ETSI EN 300 686).

7.3 Specifications at the Input Ports (§ 11.3, ITU-T Rec. G.703)

7.3.1 The input return loss at the network interface, with respect to 75 Ω, should be greater than or equal to values given in § 11.3, ITU-T Rec. G.703 (Table 3, ETSI EN 300 686).

7.4 Grounding of outer conductor or screen (§ 11.4, ITU-T Rec. G.703)

7.4.1 The outer conductor of the screen of the symmetrical pair shall be connected to the bonding network both at the input port and the output port.

8 Electrical Characteristics of 139,264 kbit/s Interface

8.1 General Characteristics (§ 12.1, ITU-T Rec. G.703)

8.1.1 The nominal bit rate shall be 139,264 kbit/s, and accuracy shall be ± 15 ppm (±2089 bit/s).

8.1.2 The signal transmitted at the output port shall comply with the Coded Mark Inversion (CMI) encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex C of ETSI EN 300 686. The input port shall correctly decode CMI encoded signals without error in accordance with CMI encoding rules as defined in Annex A of ITU-T Rec. G.703 and Annex C of ETSI EN 300 686.

8.2 Specifications at the Output Ports (§ 12.2, ITU-T Rec. G.703)

8.2.1 The pulse at the output port shall comply with the requirements given in Table 10/G.703, Figures 18 and 19/G.703 for 139,264 kbit/s digital leased lines (Table 4, ETSI EN 300 686).

8.3 Specifications at the Input Ports (§ 12.3, ITU-T Rec. G.703)

8.3.1 The input return loss at the network interface, with respect to 75 Ω, should be greater than or equal to values given in § 12.3, ITU-T Rec. G.703 (Table 6, ETSI EN 300 686).

8.4 Grounding of outer conductor or screen (§ 11.4, ITU-T Rec. G.703)

8.4.1 The outer conductor of the screen of the symmetrical pair shall be connected to the bonding network both at the input port and the output port.

9 References

9.1 For the technical requirements captured in this Specification, reference has been made to the following documents:

ITU-T Rec. G.703 (11/2001)	Physical / electrical characteristics of hierarchical digital interfaces
ITU-T Rec. G.704 (10/1998)	Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704
ITU-T Rec. G.706 (04/1991)	Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels
ETSI EG 201 730-1 V2.1.4 (2006-03)	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
ETSI EN 300 418 V1.2.1 (2001-07)	Access and Terminals (AT); 2 048 kbit/s digital unstructured and structured leased lines (D2048U and D2048S); Network interface presentation
ETSI EN 300 686 V1.2.1 (2001-07)	Access and Terminals (AT); 34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U, D140S); Network interface presentation
IEC 60950-1 (2005)	Information Technology Equipment – Safety
IEC CISPR 22 (2008)	Information Technology Equipment – Radio disturbance characteristics – Limits and methods of measurement

Annex A
Corrigendum / Addendum

Changes to IDA TS DLCN Issue 1 Rev 1, May 11			
Page	**TS Ref.**	**Items Changed**	**Date of Issue**
–	–	This Specification has streamlined and harmonised the network interface requirements for 2Mbit/s, 34 Mbit/s and 140 Mbit/s digital leased lines, based on relevant sections of the ITU-T Rec. G.703, and the ETSI EN 300 418 and EN 300 686. As digital leased line connections do not require any protocol to be exchanged at the network for call establishment and release, users may determine their use of circuit timing and data structure. The Specification has been re-issued as the IDA Technical Specification for Terminal Equipment connected to 2Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Leased Lines (“IDA TS DLCN Issue 2”).	29 Oct 13

Changes to IDA TS DLCN Issue 1, Jul 05			
Page	**TS Ref.**	**Items Changed**	**Date of Issue**
–	–	Change of IDA’s address at cover page to Mapletree Business City.	1 May 11

Changes to IDA TS DLCN 1 Issue 2			
Page	**TS Ref.**	**Items Changed**	**Date of Issue**
–	–	The IDA Technical Specification (IDA TS DLCN Issue 1) has superseded the IDA Type Approval Specification for Digital Interfaces based on hierarchical bit rates of 2048 kbit/s, 34,368 kbit/s and 139,264 kbit/s (IDA TS DLCN 1 Issue 2). The Technical Specification has also incorporated the EMC requirements, previously published under the IDA TS EMC Issue 1 Rev 1. Changes are mainly editorial in nature, in which the essential technical requirements for compliance remain unchanged.	21 Jul 05