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140 Mbit/s leased lines

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0. Document history

Every update of this document results in a complete new version with new version number and release date.

Version	Date	Main or important changes since previous version
1.1	08 FEB 1999	<ul style="list-style-type: none">•
1.2	28 DEC 2001	<ul style="list-style-type: none">• "Document history" is added.• A connection option is added.

1. Introduction

This document contains the technical specifications for the 140 Mbit/s leased line service offered by Belgacom to the customer.

These leased line specifications are based on a generic model as shown in annex 1. The central part of the model is the "connection". This connection includes a series of transmission channels or telecommunication circuits, providing the point-to-point transfer of signals between the terminal equipments of the customer.

The connection is presented to the customer via an "interface presentation" at the Network Termination Point (NTP). This NTP comprises all physical connections and their technical access specifications that form part of the Belgacom leased line network. The NTP is presented to the customer by means of an electrical equipment referred to as the Network Termination Unit (NTU). For the description of this 140 Mbit/s leased line service, the NTU is considered as being contained within the connection.

The 140 Mbit/s leased line offered by Belgacom to the customer provides a bidirectional point-to-point digital transmission capability with a usable bit rate of 139.264 kbit/s for which no structuring of the data is provided by the Belgacom network. The associated leased line network interface offered to the customer is based on the G.703-interface.

2. Connection characteristics

2.1. Transfer rate

2.1.1. Leased line timing

There's no timing provided from the Belgacom leased line network connection. On the other hand, the 140 Mbit/s leased line is capable of carrying the timing provided by the customer within the limits of 139.264 kbit/s \pm 15 ppm as specified by ITU-T Recommendation G.703.

2.1.2. Information transfer rate

The 140 Mbit/s digital leased line connection is capable of transferring an information rate of 139.264 kbit/s \pm 15 ppm.

2.2. Information transfer susceptance

The 140 Mbit/s digital leased line connection is capable of transferring unrestricted digital information of the customer.

2.3. Structure

The connection shall not be structured by the Belgacom network; the full bit rate of 139.264 kbit/s shall be available to the customer for unrestricted digital information transfer.

2.4. Establishment of communication

Establishment or release of the connection shall not require any protocol exchange or other intervention at the NTP by the customer.

2.5. Symmetry

The connection shall be symmetrical, i.e. each direction of transmission shall have the same nominal characteristics.

2.6. Connection configuration

The connection configuration shall be point-to-point.

2.7. Network performance

2.7.1. Transmission delay

The one way end-to-end delay shall be less than $(10 + 0.01G)$ ms, where G is the geographical distance in kilometres.

2.7.2. Jitter

- The 140 Mbit/s leased line shall function as specified with input jitter being the band limited component defined in table 2.7.2-1. This requirement is taken from ITU-T Recommendation G.823.

filters for generation of jitter spectrum (first order)		bandpass filter for measurement of input jitter	input jitter measured by bandpass filter
lower cut-off (high pass)	upper cut-off (low pass)	lower cut-off first order	UI peak-to-peak (maximum)
200 Hz	3 500 kHz	200 Hz to 3 500 kHz	0,05 UI

Table 2.7.2-1

- The maximum jitter at the output port of the 140 Mbit/s leased line (i.e. at the NTP towards customer's terminal equipment) shall not exceed the network limits as specified in table 2.7.2-2, when measured with first order linear filters with the defined cut-off frequencies. This requirement is taken from ITU-T Recommendation G.823.

measurement filter bandwidth		output jitter
lower cut-off (high pass)	upper cut-off (low pass)	UI peak-to-peak (maximum)
200 Hz	3 500 kHz	1,5 UI
10 kHz	3 500 kHz	0,075 UI

Table 2.7.2-2

2.7.3. Error parameters

The error performance objectives for the 140 Mbit/s digital leased lines are specified in terms of errored seconds (ES) and severely errored seconds (SES), and are at least conform to those specified in ITU-T Recommendation G.826.

3. Network interface presentation

3.1. Physical characteristics

The physical connection arrangements for the standard NTP of a 140 Mbit/s digital leased line shall consist of two 1,6/5,6 coax-connectors (one coaxial pair in each transmission direction) complying with IEC 169-13. The outer conductor of the sockets shall be connected to signal ground.

However, with the agreement of the customer, a BNC-connector may be provided as an *option*.

3.2. Electrical characteristics

The electrical characteristics of the standard NTP are in accordance with ITU-T Recommendation G.703 (75 Ohms).

3.3. Safety

Regarding the safety, the NTP complies with EN 60950 (IEC 950); the 140 Mbit/s leased line interface is in accordance with the requirements for accessible parts of a SELV circuit.

3.4. ElectroMagnetic Compatibility (EMC)

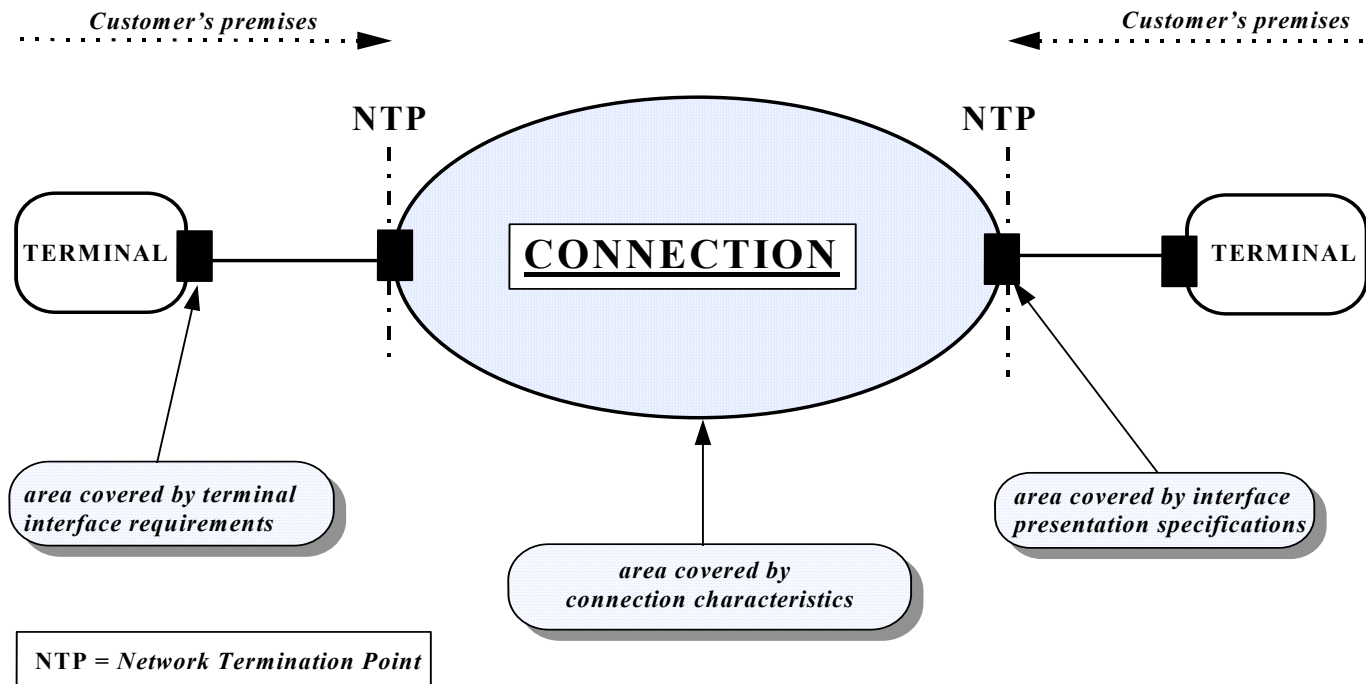
The network interface presentation fulfils to the EMC requirements which are imposed under the EMC Directive 89/336/EEC.

4. Terminal equipment

For connection to the NTP of the Belgacom 140 Mbit/s leased line, the customer's terminal has to be in accordance with ETS 300 690, taking into account that:

- Belgacom is offering the *transparent, unstructured* 140 Mbit/s leased line service to the customer;
- The physical connection arrangements for the customer's 140 Mbit/s terminal equipment shall consist preferably of two 1,6/5,6 coax-connectors (one coaxial pair in each transmission direction) complying with IEC 169-13.

Generic model for customer's leased lines specifications



ANNEX 2

Definitions and abbreviations.

Definitions

For the purpose of these technical specifications, the following definitions apply:

Errored second

A second in available time with one or more bit errors.

Severely errored second

A second in available time where at least 0,1% of the bits are errored.

Abbreviations

For the purpose of these technical specifications, the following abbreviations apply:

<u>EMC</u>	: ElectroMagnetic Compatibility.
<u>ETS</u>	: European Telecommunication Standard.
<u>ES</u>	: Errored Seconds.
<u>ITU-T</u>	: International Telecommunication Union.
<u>NTP</u>	: Network Termination Point.
<u>NTU</u>	: Network Terminating Unit.
<u>ppm</u>	: Parts per million.
<u>SELV</u>	: Safety Extra-Low Voltage.
<u>SES</u>	: Severely Errored Seconds.
<u>UI</u>	: Unit Interval.