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Proximus / BELCOMLAB
Rue Carlistraat 2
B-1140 Evere
Belgium

tel: +32 2 244.58.88
fax: +32 2 244.59.99
E-mail: belcomlab@Proximus.be

Transmission and interface characteristics of ISDN service

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1. Introduction

The Integrated Services Digital Network (ISDN), created from the digitization of the telephone network, offers customers a wide range of services via fully digital connections. Access to the ISDN network is possible via a user-network interface, which has been fully defined in international ITU-T and ETSI recommendations.

The customer has the choice between two types of access, namely :

- basic access (BA);
- Primary Rate Access (PRA).

Paragraph 2 of this document contains the specifications for the two ISDN access interfaces mentioned above. Paragraph 3 describes the transmission characteristics of ISDN connections.

2. ISDN interface characteristics

- Figure 1 shows the reference configuration of an ISDN user-network interface. Definitions of the various functional groups (NT1, NT2, TE1, TA and TE2) and the related reference points (R, S and T) can be found in ITU-T recommendation I.411.

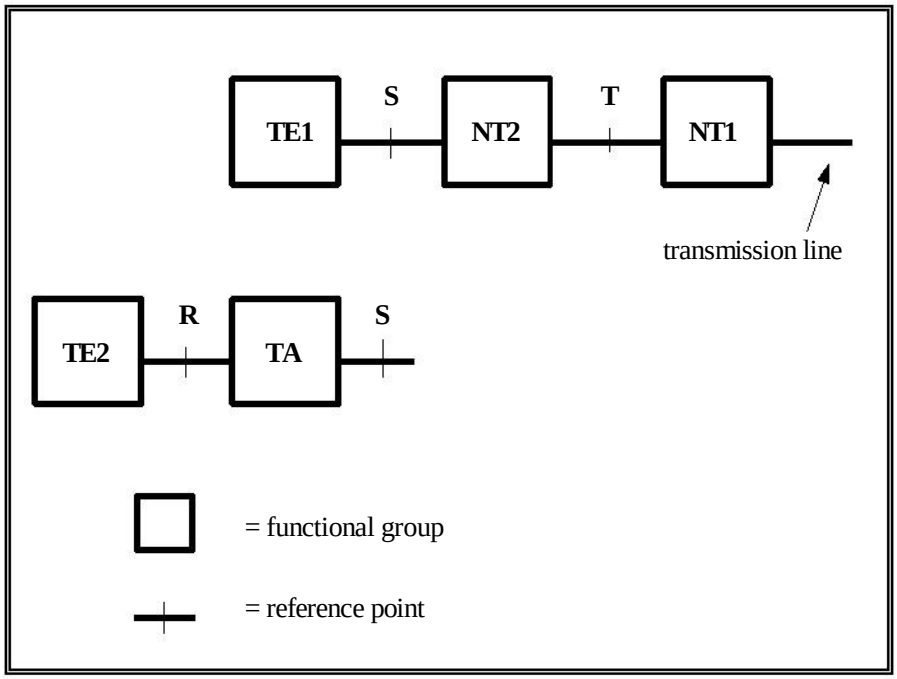

Figure 1

- The definition of the functional groups mentioned above is based on the fact that the protocol for ISDN network access theoretically consists of three layers, i.e. the three lower layers of the OSI model (Open Systems Interconnection): the physical layer (Layer 1), the data link layer (Layer 2) and the network layer (Layer 3).

- The ISDN connection terminates on NT1 equipment at the customer's premises; this NT1 is supplied by Proximus. This equipment primarily fulfills Layer 1 functions, as described in paragraph 3 of ITU-T recommendation I.411, and is therefore transparent for higher layers.

- The various interface structures for the ISDN user-network interface are described in ITU-T recommendation I.412. Proximus offers two types of access:

  * *basic access:*
    This basic access consists of two B channels and one D channel; the B channel has a rate of 64kbit/s and the D channel 16kbit/s. These three channels can be used simultaneously for different purposes.

  * *primary access (primary rate):*
  Proximus offers a 2,048kbit/s 30B+D-type primary access, as defined in ITU-T recommendation I.412.

- The NT1 S/T interface for enabling basic access (BA) is compliant with ITU-T recommendation I.430 as far as Layer 1 specifications are concerned. This S/T interface is offered to the customer in the form of a female connector type ISO 8877 (RJ45 connector).

- The NT1 S/T interface for enabling primary access (PRA) is compliant with ITU-T recommendation I.431 as far as Layer 1 specifications are concerned. This S/T interface is made available to the customer in the form of a female RJ45-connector or a connection block for establishing a hardwired connection. N.B.: Proximus only offers 30B+D access.

  The electrical characteristics of this interface are compliant with ITU-T recommendation G.703. The frame structure of the signal complies with ITU-T recommendation G.704, in which case procedure CRC4 may or may not be activated.

3. Transmission characteristics

- ISDN offers customers *fully digital* connections.

- For basic access (2B+D), the transmission characteristics of the digital access section are described in detail in ETSI specification ETR 80.

It should be noted that Proximus has opted for an NT1 line signal encoded in accordance with the 4B/3T diagram (Modified Monitoring State) pursuant to Appendix B of ETR 80.

- Theoretically, the NT1 U interface for enabling *basic access* receives its power supply from the Proximus ISDN network (via local cable) and the S-bus via the local 230V supply mains. NT1 equipment switches to emergency mode if the voltage of the 230V mains connection drops below a certain threshold. Under such conditions, the NT1 will be able to supply power to one phone from the U interface, in compliance with paragraph 9 of ITU-T recommendation I.430.

4. References

ETR 80:	Transmission and Multiplexing; Integrated Services Digital Network (ISDN) basic rate access; Digital transmission system on metallic local lines.
ITU-T recommendation I.411:	ISDN user-network interfaces - Reference configurations.
ITU-T recommendation I.412:	ISDN user-network interfaces - Interface structures and access capabilities.
ITU-T recommendation I.430:	Basic user-network interface - Layer 1 specification.
ITU-T recommendation I.431:	Primary rate user-network interface - Layer 1 specification.
ITU-T recommendation G.703:	Physical/electrical characteristics of hierarchical digital interfaces.
ITU-T recommendation G.704:	Synchronous frame structures used at primary and secondary hierarchical levels.