Technical Document PTC 132

Spark NZ ISDN

User-Network Interface

Layer 1: Primary Rate Access

Access Standards
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SPARK ISDN USER-NETWORK INTERFACE

LAYER 1

PRIMARY RATE ACCESS

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FOREWORD

This Specification is issued by Spark in compliance with its undertakings to advise the New Zealand telecommunications industry on forthcoming changes in the Telecom telecommunication networks.

This Specification is one of a series which defines the Telecom implementation of ISDN. It covers the technical requirements for the various hardware items used as the network terminations and customer premises terminal equipment interfaces, but leaves the design details and facilities of such hardware to individual manufacturers to decide.

The success of ISDN in New Zealand depends on the cooperation and support given by local hardware and software suppliers in providing the specialised equipment and systems for the various new services that this network will make possible.

This Specification describes the Layer 1 requirements for the control of ISDN services between Telecom's Integrated Services Digital Network (ISDN) and a single unit of user's equipment, eg. a terminal or small business system on a Primary rate access. This Specification applies at the T interface or the coincident S/T reference point.

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1. Scope

The ISDN is defined in the I-series Recommendations of the Standardisation Bureau of the International Telecommunication Union (ITU-T), formerly the International Telegraph and Telephone Consultative Committee (CCITT). It is a plan for organising digital technology to provide advanced services to sophisticated digital terminals over an end-to-end digital network.

ISDN services are offered by the network to a user via an interface that provides either Basic access, consisting of one 16 kbit/s D-channel and up to two 64 kbit/s B-channels, or Primary rate access, consisting of one 64 kbit/s D-channel and up to thirty 64 kbit/s B-channels.

This Specification describes the Layer 1 requirements for the access protocol for the Primary Rate Access user-network interface between Telecom's Integrated Services Digital Network (ISDN) and a single unit of user's equipment, eg. a terminal or small business system. This protocol applies at the T reference point or the coincident S/T reference point.
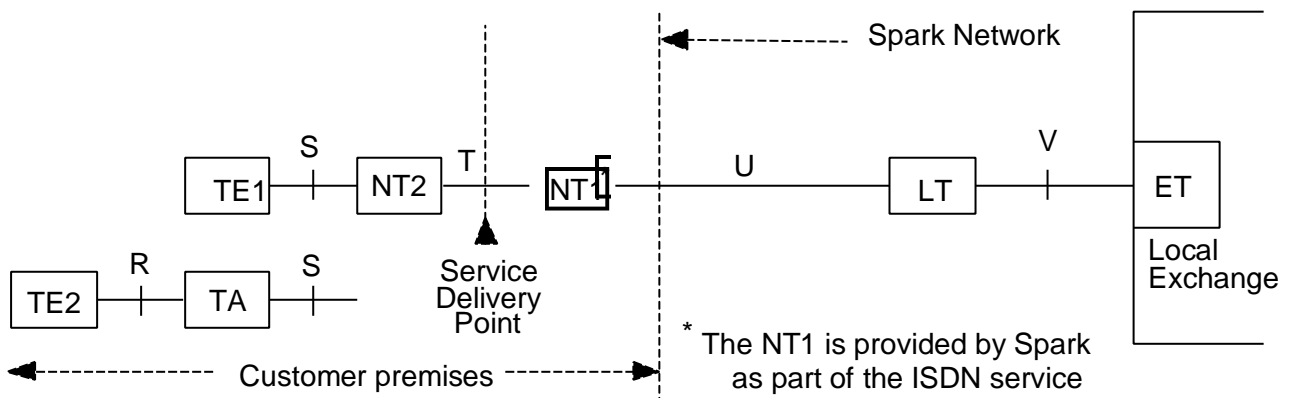

FIGURE 1

ISDN Access Reference Model

ET	Exchange terminal	TA	Terminal Adaptor
LT	Line Terminal	TE1	ISDN Terminal
NT1	Network Termination 1	TE2	Non-ISDN Terminal
NT2	Network Termination 2	S,T,U,V	Reference points

The NT1, LT and ET will be provided by Telecom as an inherent part of the ISDN service
The TA may also be provided with some service offerings.

The interface is functionally organised into the first three layers of the ISO Open Systems Interconnection 7-layer model, consisting of the physical layer (Layer 1), the data link layer (Layer 2) and the network layer (Layer 3). Layer 1 for the Primary rate access is the focus of this Specification.

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The following Specifications together specify the requirements for ISDN connections:

	Basic Access	**Primary Rate Access**
Layer 1	PTC 131 [1]	PTC 132
Layer 2	TNA133 [2]	
Layer 3	TNA134 [3]	

PTC 131 defines the layer 1 aspects of the user-network interface for the attachment of terminals. It is intended for terminal vendors and users.

2. Definitions

D-Channel-   A 16 kbit/s or 64 kbit/s channel carrying signalling, low speed packet switched data, and user-to-user information. (see ITU-T Recommendation I.412 [6]).

B-Channel-   A 64 kbit/s channel that carries customer information such as voice, circuit switched or packet switched data. (see ITU-T Recommendation I.412).

PORT   An interface on a piece of equipment for the purpose of supplying an output signal or accepting an input signal.

USER   User's equipment eg. terminal.

Note. The definitions of ITU-T Recommendations G.701 [4] and I.112 [5] also apply.

3. Abbreviations

ETSI   European Telecommunications Standards Institute

IEC   International Electrotechnical Commission

ISDN   Integrated Services Digital Network

ISO   International Standards Organization

ITU   International Telecommunications Union

ITU-T   International Telecommunications Union - Telecommunications Standard

NT1   Network Termination Type One (see ITU-T Recommendation I.411)

NT2   Network Termination Type Two (see ITU-T Recommendation I.411)

TA   Terminal Adaptor (see ITU-T Recommendation I.411)

TE1   Terminal Equipment of type 1 - ISDN terminal (see ITU-T Recommendation I.411)

TE2   Terminal Equipment of type 2 - non-ISDN terminal (see ITU-T Recommendation I.411)

TEI   Terminal Endpoint Identifier (see ITU-T Recommendations Q.920 and Q.921)

Telecom   Telecom New Zealand Limited

4. References

[1]   PTC 131, "Telecom ISDN user-network interface: Layer 1: Basic access", 1997

[2]   TNA 133, "Telecom ISDN user-network interface: Layer 2", 1997

[3]   TNA 134, "Telecom ISDN user-network interface: Layer 3", 1997

[4]   ITU-T Recommendation G.701, "Vocabulary of digital transmission and multiplexing, and pulse code modulation (PCM) terms."

[5]   ITU-T Recommendation I.112, "Vocabulary of terms for ISDNs."

[6]   ITU-T Recommendation I.412, "ISDN user-network interfaces - interface structures and access capabilities.

[7]   ITU-T Recommendation I.430, "ISDN Basic user-network interface - Layer 1 specification", 1995

[8]   ITU-T Recommendation I.431, "ISDN Primary rate user-network interface - Layer 1 specification", 1993

[9]   ITU-T Recommendation I.440 (Q.920), "ISDN user-network interface data link layer - general aspects", 1993

[10]   ITU-T Recommendation I.441 (Q.921), "ISDN user-network interface data link layer - specification", 1993

[11]   ITU-T Recommendation I.451 (Q.931), "ISDN user-network interface layer 3 specification", 1993

[12]   ITU-T Recommendation Q.932, "Generic procedures for the control of ISDN supplementary services."

[13]   ETS 300 011, "Primary rate user-network interface Layer 1 specification and test principles", 1992

5. Specification (PTC 132)

The requirements for this Specification are defined in ITU-T Recommendation I.431 [8]. The options which apply are identified below. References are to clauses in this Recommendation.

Clause 4   The interface at 1544 kbit/s does not apply

Clause 5   The interface at 2048 kbit/s applies
It is recommended that the CRC procedures and setting of the RAI signal are fully implemented as this will assist in the early detection and resolution of faults.

Clause 6   The preferred connection between the NT1 and TE is permanent connection using insulation displacement terminations

Clause 7   Interface wiring uses symmetrical wiring with a charactersitic impedance of 120 ohm.

Clause 8   Power feeding from the TE to the NT is not required.

6. Compliance with ETSI Standards

ETS 300 011 [13] is based on the 1988 version of ITU-T Recommendation I.431 with modifications and additions. These changes were essentially included in the latest version of ITU-T Recommendation I.431 on which this Specification is based.

Compliance with ETS 300 011 will be accepted as compliance with this Specification.