

**Technical Document
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**Telecom ISDN
User-Network Interface:
Layer 2**

Access Standards
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**TELECOM ISDN USER-NETWORK INTERFACE
LAYER 2**

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FOREWORD

This Specification is issued by Telecom 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 2 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 Basic access or Primary Rate access. This Specification applies at the T interface or the coincident S/T reference point.

TELECOM ISDN USER-NETWORK INTERFACE LAYER 2

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 30 64 kbit/s B-channels.

This Specification describes the Layer 2 requirements for the access protocol for the Basic 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 and to both Basic (2B + D) and Primary rate (30B + D) interfaces. Examples of interface configurations are shown in Annex A.

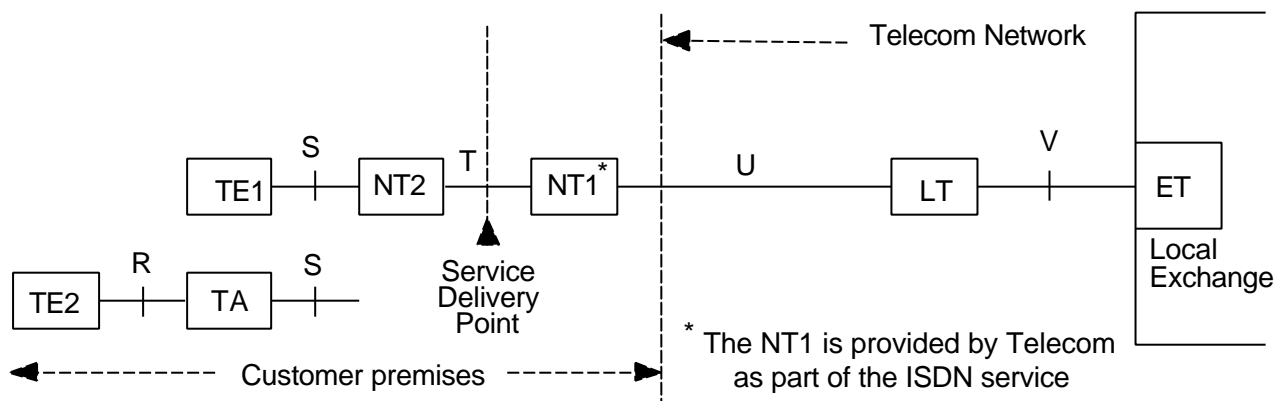


FIGURE 1

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.

The following Specifications together specify the requirements for ISDN connections:

	Basic Access	Primary Rate Access
Layer 1	PTC 131 [1]	PTC 132 [2]
Layer 2	TNA 133	
Layer 3	TNA 134 [3]	

TNA 133 defines the layer 2 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).
H0-Channel-	A 384 kbit/s channel that carries customer information such as voice, circuit switched 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)
PCU	Power Consumption Unit
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] PTC 132, "Telecom ISDN user-network interface: Layer 1: Primary Rate Access", 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", 1993
- [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 300 402-1, "Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer: Part 1: General aspects [ITU-T Recommendation Q.920 (1993), modified]", 1995
- [14] ETS 300 402-2, "Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer: Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]", 1995

5. Specification

The requirements for this Specification are defined in ITU-T Recommendations I.440 (Q.920) [9] and I.441 (Q.921) [10]. The options which apply are identified below. References are to clauses in Recommendation Q.921.

Clause	Modification
1	Delete the last sentence referring to abstract test suites.
2.3	LAPB data link connections are not supported.
3.3.3	SAPI value 12, defined by ETS 300 402-2 [14], is not supported.
3.6.7	The optional procedures for the retransmission of a REJ response frame is not supported.
5.8.1	The optional procedures for the retransmission of a REJ response frame is not supported.
5.10	The data link layer monitor function is implemented on the network side. It is optional on the user side.
Annex A	<p>Primary rate interfaces will use a single point-to-point signalling connection. As a subscription option, Basic rate interfaces may use a single point-to-point signalling connection.</p> <p>The following shall apply to a Point-to-point signalling connection:</p> <ul style="list-style-type: none"> • Layer 2 management procedures according to subclause 5.3 shall not be used; • the value 0 shall be used for the TEI; • two peer-to-peer layer 3 signalling entities shall communicate over a single point-to-point data link connection within the SAP identified by SAPI value 0, making use of the acknowledged information transfer service provided by layer 2; • any message associated with TEI administration procedures, if received, shall be discarded and no action shall be taken as a result of the receipt of that message.

Appendix I The optional procedures for automatic negotiation of data link parameters is supported by the network. It is optional on the user side.

6. Compliance with ETSI Standards

Compliance with ETS 300 402-2, "Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer: Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]", 1995 [14] will be considered as compliance with this Specification.