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Zuni Interface with U Signalling

Účel:

Dokument začleňuje stávající vnitřní technický normativ společnosti (viz příloha) do nového jednotného systému správy řídicích dokumentů společnosti Telefónica O2 Czech Republic, a.s.

Působnost:

Působnosti, odpovědnosti a pravomoci se podle zásad původního technického normativu přenášejí na věcně příslušné odpovídající organizační složky společnosti Telefónica O2 Czech Republic, a.s.

Proces:

Provozní podpora

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1. Úvodní ustanovení

1.1. Účel

Tento dokument se vydává z důvodu začlenění stávajícího vnitřního technického normativu společnosti jako platného dokumentu do nového jednotného systému správy řídicích dokumentů společnosti Telefónica O2 Czech Republic, a.s. podle směrnice M832.SM0001 Řídicí dokumenty (Managing Documents).

1.2. Působnost, odpovědnosti a pravomoci

Působnosti, odpovědnosti a pravomoci se podle zásad původního technického normativu přenášejí na

věcně příslušné odpovídající organizační složky (útvary, zaměstnance) v rámci celé společnosti Telefónica O2 Czech Republic, a.s.

1.3 Zkratky a pojmy

Zkratky a pojmy uvádí původní technický normativ v příloze tohoto dokumentu.

1.4 Související dokumenty

Související dokumenty, odpovídající době vzniku, uvádí původní technický normativ v příloze tohoto dokumentu (viz datum schválení na titulní straně). Při použití původního technického normativu je třeba přiměřeně respektovat aktuální platné verze všech souvisejících dokumentů.

2. Zásady správy a užívání dokumentu

Tento dokument spravuje věcně příslušný zaměstnanec uvedený v databázi jako autor/garant dokumentu. Revize a tvorba nových verzí probíhají podle směrnice M832.SM0001 Řídicí dokumenty (Managing Documents) s upřesněním podle směrnice B400.SM000531 Technická normalizace společnosti.

3. Závěrečná a přechodná ustanovení

Tento dokument upřesňuje status původního technického normativu. Formálně se tímto původní technický normativ ruší a nahrazuje. Další samostatné používání původního technického normativu bez nového identifikátoru a tohoto upřesňujícího textu se nadále nepovoluje.

4. Přílohy

Technický normativ původně vydaný a spravovaný v rámci samostatného informačního systému podnikových technických normativů právních předchůdců společnosti Telefónica O2 Czech Republic, a.s.

ČESKÝ TELECOM

TECHNICAL SPECIFICATION

TSPE 2078

Z_{UNI} INTERFACE

WITH U SIGNALLING

Approved: 24. 8. 2004

Content:

1. Initial provisions

1.1. Scope

The purpose of this document is to specify characteristics of interfaces to be used between AN and TEs on one side and between AN and SNs (LE, LL, DN, ...) on the other side, in the access network of ČESKÝ TELECOM, a.s.

1.2. Validity and obligation

The document is according to the valid company regulation documents of ČESKÝ TELECOM, a.s. obligatory for NU - ND and is to be considered a valid recommendation within the entire company ČESKÝ TELECOM, a.s. It is valid from the date of approval (see the first page).

1.3. References

The document replaces TPK 2027A "UNI AND SNI INTERFACES OF TRANSMISSION EQUIPMENT FOR ACCESS NETWORK" - part 3.1 (ČESKÝ TELECOM, a.s. - 10.3.1999)

Other related documents:

ITU-T Q.512	Exchange interface for subscriber access; 1989
ITU-T Q.522	Transmission characteristics at 2-wire analogue interfaces of digital exchange; 1988
ITU-T I.411	ISDN user-network interfaces-reference configurations; 1988
ITU-T I.430	Basic user-network interface layer 1 specification; 1988
ITU-T I.431	Primary Rate User-Network Interface Layer 1 Specification; 1988
ITU-T G.703	Physical/Electrical characteristics of hierarchical digital interfaces; 1988
ITU-T G.704	Synchronous frame structures used at primary and secondary hierarchical level; 1988
ITU-T G.706	Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in recommendation G.704; 1988
ITU-T G.712	Transmission performance characteristics of pulse code modulation; 1992
ITU-T X.21	Interface between Data Terminal Equipment and Data Circuit Terminating Equipment for synchronous operation on Public Data Networks; 1992
ITU-T G.823	The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy; 1993
ETS 300 001	Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN; 1992
ETS 300 011	Integrated Services Digital Network; Primary rate user-network interface Layer 1 specification and test principles; 1992
ETS 300 011/A1	Integrated Services Digital Network; Primary rate user-network interface Layer 1 specification and test principles;1992
ETS 300 012	Integrated Services Digital Network (ISDN); Basic user-network interface Layer 1 specification and test principles; April 1992
ETS 300 125	Integrated Services Digital Network (ISDN); User-network interface data link layer specification. Application of ITU-T Recommendations Q.920/I.440 and Q.921/I.441; 1991

ETS 300 324	Signalling protocol and Switching (SPS);V interfaces at the digital Local Exchange (LE) V 5.1 interface for the support of Access Network (AN); 1994
ETR 080	Transmission and Multiplexing (TM); ISDN basic rate access; Digital transmission system on metallic local lines; July 1993
ETS 300 659-1	Public switched telephony network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On hook data transmission - Draft version 1.3.1 – 2001-01
ETS 300 659-3	Public switched telephony network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 3: Data link message and parametr codings - Draft version 1.3.1 – 2001-01
ETS 300 648	Public switched telephony network (PSTN); Calling Line Identification Presentation (CLIP) supplementary service; Service description Edition 1 – 1997-03

1.4. Definitions and terms

- not used -

1.5. Abbreviations and Acronyms

ANE	Access Network Element
APS	Auxiliary Power Supply
DDI	Direct dialling in
CLIP	Calling Line Identification Presentation
DLL	Digital Local Line
DN	Data Network
DTS	Digital Transmission System
EOC	Embedded Operations Channel
IPS	Internal Power Supply
ITS 2M	Integral Transmission System with 2084 kbitps bit rate
LE	Local Exchange
LL	Leased Line
LT	Line Termination
LTU	Line Termination Unit
PABX	Private Automatic Branch Exchange
PSTN	Public Switching Telephone Network
R	Resistance
SN	Service Node
SNI	Service Node interface
TS	64 kbps Time Slot
UOA	DLL-Only-Activation
UNI	User Network Interface

For not listed terms and abbreviations see related documents.

2. ACCESS NETWORK INTERFACES

The following *Figure 1* describes the generic structure of an ANE.

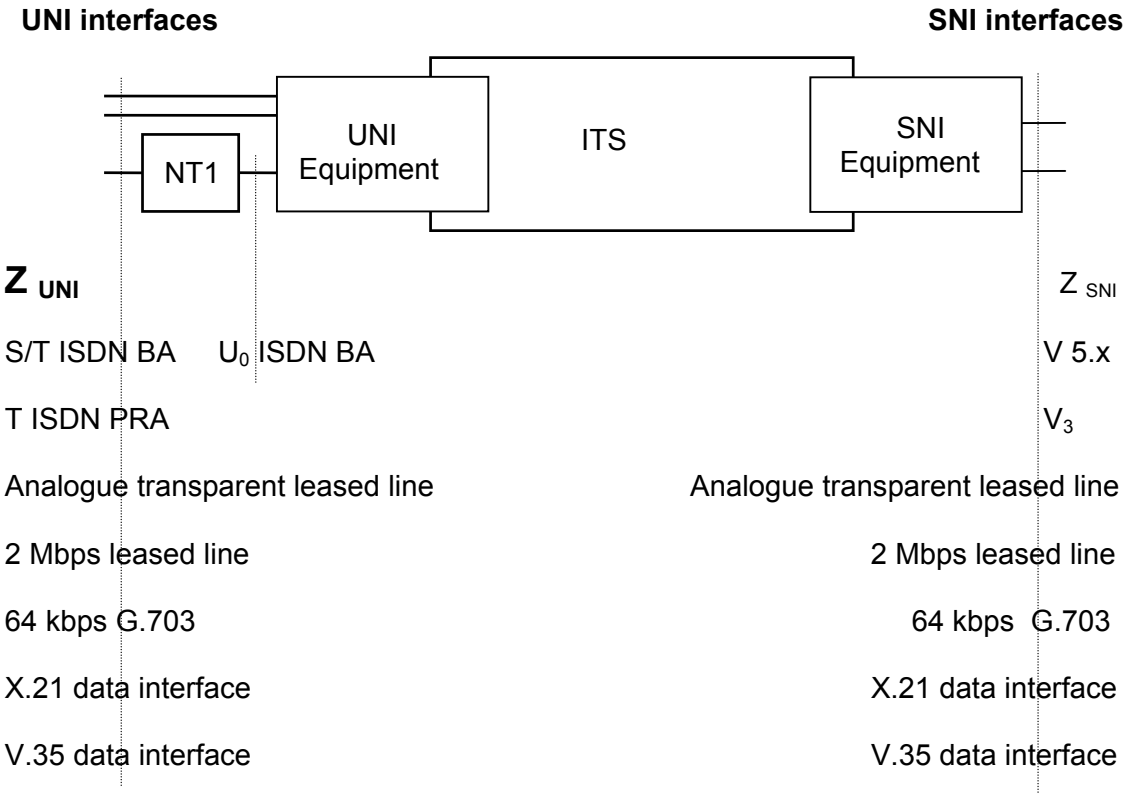

Figure 1: Generic structure of ANE

3. Z_{UNI} interface with U signalling

3.1. Application area

This interface shall be used between ANE and a subscriber terminal with the analog subscriber loop signaling (telephone set, fax, answering machine, ...).

The parameters of the Z_{UNI} interface may be modified (reduced) if the maximum required subscriber loop resistance of ANE is less then 1450 Ω. In this case ANE must fulfill requirements of ETS 300 001 for electrical parameters at the subscriber socket and the required parameters are described for the loop resistance 1450 Ω, 500 Ω and 200 Ω without resistance of TE.

3.2. Static parameters of subscriber loop

3.2.1. Max. R of subscriber loop

There are used three classes of maximum subscriber loop resistance in the SPT TELECOM, a.s. access network, i.e.

Standard subscriber loop ..... 1450 Ω + R of TE *)

Reduced subscriber loop 1 ..... 500 Ω + R of TE *)

Reduced subscriber loop 2 ..... 200 Ω + R of TE *)

*) VA characteristic of TE see fig. 2 (subscriber set reaches this value in 100ms after off-hook).

3.2.2. Min. insulating resistance between a-b wires..... 20 kΩ

3.2.3. Maximum capacity between a-b wires.....…..... 0,75 μF

3.2.4. Minimum current of the loop.....…..... 15 mA

3.2.5. Recommended current of the loop.....…... 20 to 25 mA

Nominal loop current 20 to 25 mA must be reached in 160 ms after off-hook.

3.2.6. Maximum current of the loop

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Maximum current	15 - 70 mA	15 - 60 mA	15 - 60 mA

3.2.7. Maximum voltage a-b in the on-hook state

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Maximum voltage	66 V	27.3 V	27.3 V

3.2.8. Minimum voltage a-b in the on-hook state

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Minimum voltage	35 V	24.7 V	24.7 V

3.2.9. Maximum loop current in faulty loop (parking) state

Maximum current ..... 7 mA.

See also 3.1.5.3: This condition is mandatory in case of continuous high resistance supervision for the subscriber loop in faulty loop state, in case of low resistance periodical supervision for faulty loop, only recommendation 3.1.5.3 must be met.

3.2.10. Maximum current in the loop idle state ..... 3 mA

3.2.11. Protection of the line against overvoltage and overcurrent must fulfill ITU-T Recommendation K.20, K.21.

3.3. Transmission parameters at Z_{UNI} interface

3.3.1. Max. attenuation of the access line

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Maximum attenuation	7 dB/ 1020 Hz	5.36 dB/ 1020 Hz	2.14 dB/ 1020 Hz

3.3.2. Transmitting tone level

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Tone level	-12 dBm ± 1 dBm	min. -19 dBm	min. -22 dBm

3.3.3. Transmitting signal levels

3.3.3.1. Relative level .....0 dBr

3.3.3.2. Tolerance of level adjustment .....± 0,4 dB

3.3.3.3. Short term (10 minutes) level stability .....± 0,1 dB

3.3.3.4. Long term (1 year) level stability .....± 0,3 dB

3.3.4. Receiving signal levels

3.3.4.1. Relative level .....-7 dBr

3.3.4.2. Tolerance of level adjustment .....± 0,4 dB

3.3.4.3. Short term (10 minutes) level stability .....± 0,1 dB

3.3.4.4. Long term (1 year) level stability .....± 0,3 dB

3.3.5. Impedance of ANE

Two types of impedance are possible:

- Z_R = 600 Ω
- Z_C = 220 Ω serial with (115 nF parallel 820 Ω)

NOTE: If ANE does not allow for a choice between these two alternatives, impedance Z_c is preferred.

If the value of return loss fulfills requirement given in the following paragraph, other type of complex impedance is possible.

3.3.6. Return loss of terminating impedance

Frequency range (Hz)	Return loss (dB)
300 - 600	≥ 14
600 - 3400	≥ 18

3.3.7. Longitudinal conversion loss (LCL)

LCL is required according to the Table 4, 2 wire connection Z = 600 Ω of ITU-T Recommendation G.712, Section 6.

3.3.8. Longitudinal conversion transfer loss (LCTL)

LCTL is required according to the Table 5, 2 wire connection Z = 600 Ω of ITU-T Recommendation G.712, Section 6.

3.3.9. Terminal balance return loss (TBRL)

TBRL shall comply with requirements of the ITU-T Recommendation G.712, Section 16.1. The impedance Z_C (see 3.3.5) shall be used as the balance test network.

3.3.10. Attenuation frequency characteristics

Distortion of the ANE frequency characteristic between Z_{UNI} and the relevant SNI shall comply with ITU-T Recommendation G.712, Section 7

- Fig.3, if SNI is an analogue interface or
- Fig.5, if SNI is a digital interface.

3.3.11. Absolute group delay

Absolute group delay of the ANE between Z_{UNI} and the relevant SNI at the frequency of the minimum group delay shall not exceed

- 750 μs, if SNI is an analogue interface or
- 450 μs in the transmitting direction and 300 μs in the receiving direction, if SNI is a digital interface.

3.3.12. Group delay frequency characteristic

Group delay frequency characteristic of the ANE between Z_{UNI} and the relevant SNI shall comply with ITU-T Recommendation G.712, Section 8.2

- Fig.7, if SNI is an analogue interface or
- Fig.9, if SNI is a digital interface.

3.3.13. Noise parameters

Noise parameters of the ANE at Z_{UNI} shall comply with relevant requirements of ITU-T Recommendation G.712, Sections 9 to 15.

3.4. Evaluation time of the A subscriber (calling subscriber)

3.4.1. Recognition of the subscriber loop closing:

not evaluated ..... < 20 ms

off-hook of the calling subscriber ..... ≥ 300 ms

3.4.2. Recognition of the loop interruption:

not evaluated ..... < 10 ms

flash ..... 30 - 180 ms

not evaluated as on-hook of the calling subscriber ..... ≤ 185 ms

on-hook of the calling subscriber ..... ≥ 400 ms

3.4.3. Decade dialling parameters are presented in Figure 3

3.5. Evaluation time of the B subscriber (called subscriber)

3.5.1. Recognition of the subscriber loop closing:

not evaluated ..... < 10 ms

during ringing ..... ≥ 100 ms

in other states ..... ≥ 200 ms

3.5.2. Recognition of the loop interruption:

not evaluated ..... < 10 ms

flash ..... 30 - 180 ms

not evaluated as on-hook of the called subscriber ..... ≤ 185 ms

on-hook of the called subscriber ..... ≥ 400 ms

3.5.3. Time for faulty loop (parking state) escape..... ≤ 5 s

3.6. Ringing

3.6.1. Nominal rms. of the ringing generator voltage

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Nominal RMS	75 ± 5 V	57 V ± 5 %	52 V ± 5 %

3.6.2. Voltage of the ringing generator at 2KΩ load

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Ringing voltage	≥ 55 V	45 V ± 5 %	39 V ± 5 %

3.6.3. Frequency of the ringing current ..... 25 ± 2 Hz or 50 ± 2 Hz

……harmonious signal with distortion max. 5%

3.6.4. Ringing current superposed with the DC supply voltage at 2KΩ load

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
Min. 16 kHz level	- 48 V	- 27 V	- 27 V

3.6.5. Time of immediate pulse duration .....360 - 1100 ms

3.6.6. Time of a pulse duration .....1000 ms +/- 10 %

3.6.7. Time of a pause duration .....4000 ms +/- 10 %

3.6.8. If the minimum pause between the immediate and the first periodic ringing is not secured at least 200 ms, the maximum time of the duration of both (joint) pulses is 1400 ms.

3.7. Transmission of metering pulses

3.7.1. Pulse length .....140 ± 40 ms

3.7.2. Pulse frequency .....16 kHz ± 80 Hz

3.7.3. Distortion .....< 1 %

3.7.4. 16 kHz output impedance .....200 Ω ± 10 %

3.7.5. 16 kHz transmitting level (with load)

Max. R of subscriber loop	1450 Ω	500 Ω	200 Ω
16 kHz level	2.6 V ± 0.5 V	1.5 V ± 0.1 V	0.4 V ± 0.1 V

3.7.6. Maximum charging rate .....3 pulses/s.

3.8. Transmission of Calling Line Identification Presentation (CLIP)

3.8.1. Transmission of CLI is based on ETSI EN 300 659-1 in variant associated with ringing, during ringing.

3.8.2. Data format and coding of CLI contains following parameters (according with ETSI EN 300 659-3, chapter 5.2.1):

Date and Time

Calling Line Identification or rason of Calling Line Identification Absence

Called Line Identification

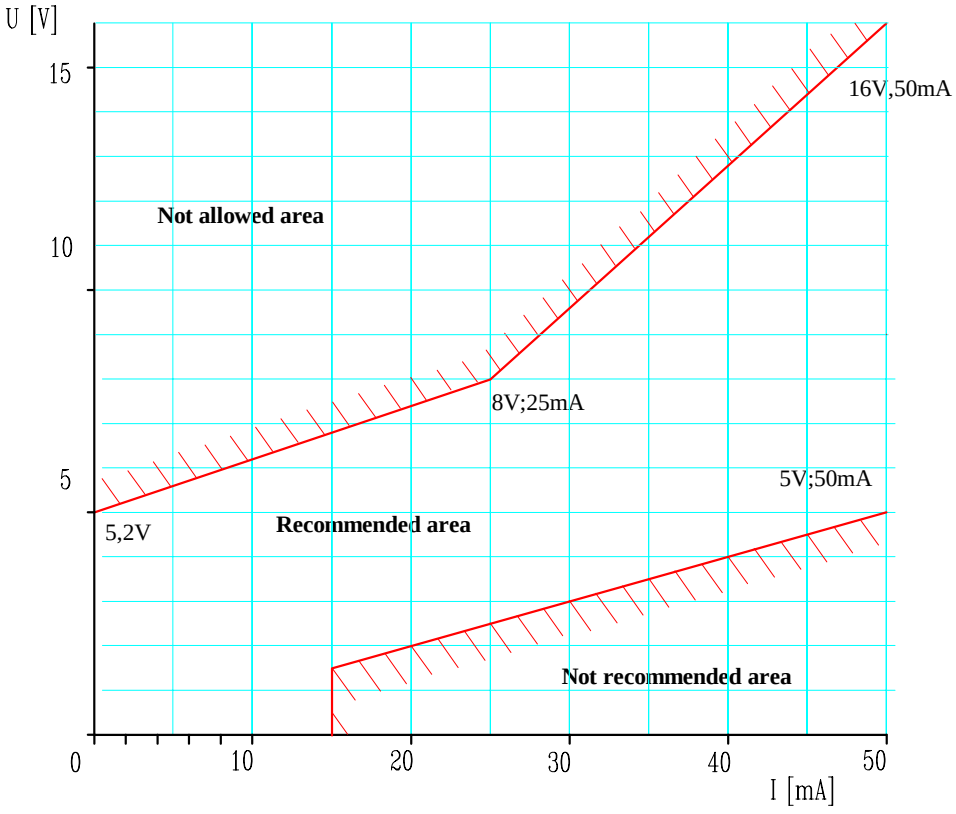

Figure 2:
Cut-off V-A characteristic of terminal equipment

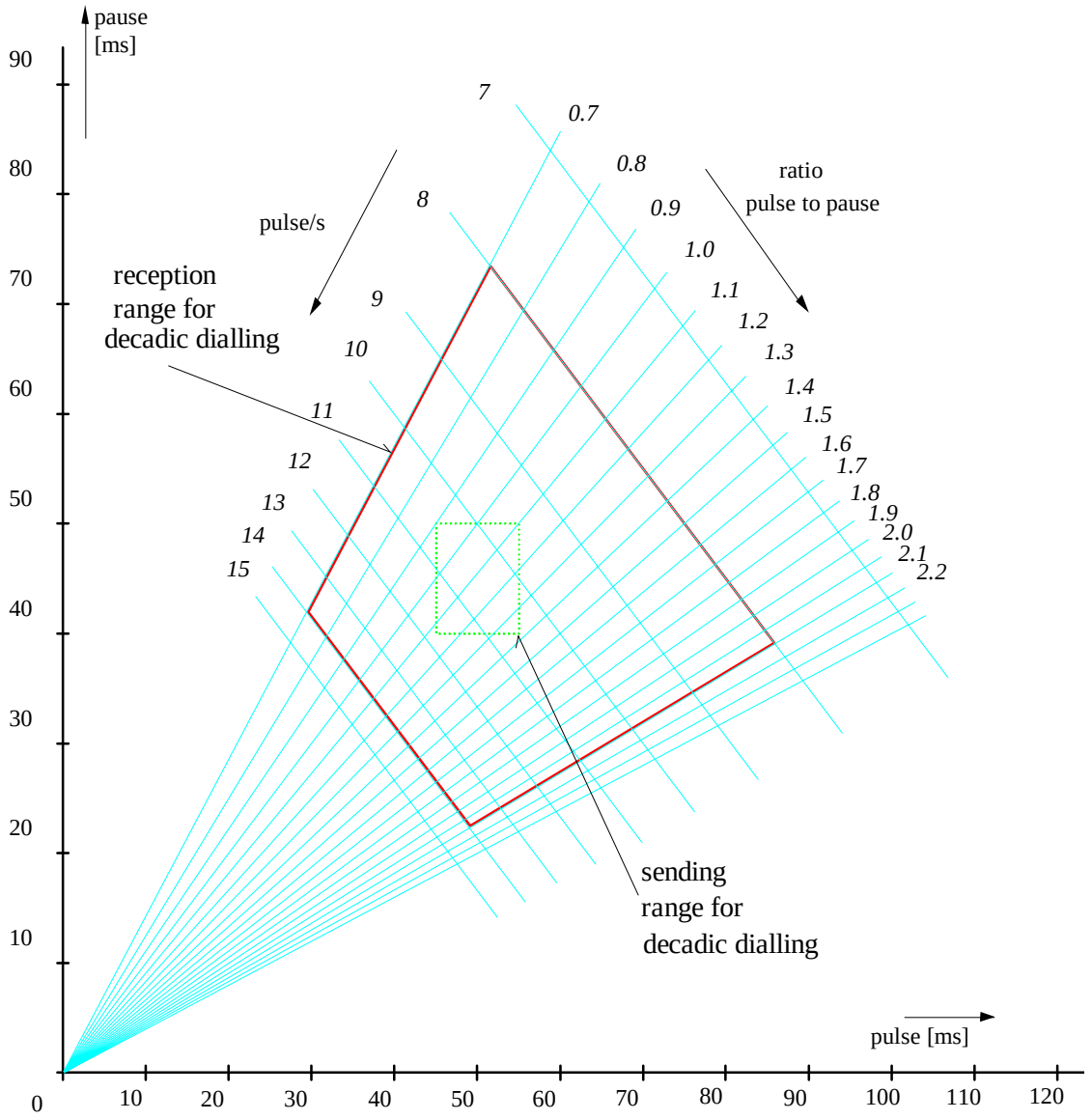

Figure 3:
Time parameters of decadic dialling

TSPE 2078 - Z_{UNI} INTERFACE WITH U SIGNALLING

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