



**Publication of
specifications for the
analogue and digital network
interfaces offered by Wind**

NW.ID.IT.AF.DTSV1401, *Rev.0.1*
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and digital network interfaces offered by Wind**

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1. SCOPE

The purpose of this document is to provide the standard technical specifications for the analogue and digital network interfaces supplied by Wind for access to telecommunications services, in compliance with Legislative decree no. 269 of May 9, 2001 and the Ministry of Communications Decree no.95 of March 20, 2002.

This document is not binding for Wind, which reserves the right to update it in the event of the development of new services that could require modification of the interfaces described or the supply of new interfaces, or in the event of developments in the reported reference standards.

2. REFERENCES

The references are reported separately in the paragraphs describing the interfaces.

However, an effort has been made to describe the interfaces in question, where possible, according to the standards.

[1] ETSI TR 101 730 - Guidelines for describing analogue line interfaces

[2] ETSI TR 101 731 - Guidelines for describing digital line interfaces

3. INTERFACES ON OFFER

3.1 TYPES OF INTERFACE

The voice and data interfaces that Wind offers its users are grouped together in the table below. The technical reference presented and the associated service are reported according to the interface offered.

Interfaces	Type	Notes	Service ¹
POTS	Analogue 2w		Canone Zero
ISDN	ISDN BRI ISDN BRI	Vd para. 3.3.1 and 3.3.2	Canone Zero
Data and Ethernet	V/X/G Ethernet/Fast Ethernet	Vd para. 3.3.3	WindConnect Canone Zero NetRide
PDH	E1/E3	Vd para. 3.3.4	WindLink

¹ The inclusion of the service names is purely indicative and subject to change

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Interfaces	Type	Notes	Service*
			WindConnect
SDH	STM-1/4/16/64	See para. 3.3.4	WindLink

3.2 ANALOGUE INTERFACES (POTS)

POTS interfaces adhere to the aforementioned standards.

3.2.1 REFERENCE STANDARDS

[1] ETSI TBR 21 (01/98) “Terminal Equipment (TE); Attachment requirements for pan European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE s(excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling ETSI”

[2] ITU-T Q.552 (11/96)

[3] Technical specification ISCTI n.768 “Analogue user’s connections for urban telephone exchanges”, 2003

3.2.2 TECHNICAL SPECIFICATIONS

The POTS interface is physically offered to the client through NTP certification indicated in the Technical Specifications published by the incumbent operators.

To supplement the specifications [1] and [3] reference has been made to some of the POTS interface’s significant values

3.2.2.1 DC Voltage-feed conditions

Function	Attribute/Measurement unit	Value
DC feed	Resistance	2 x 400
	Current (mA)- max	40
	Current (mA) min	18
	Optional current	35
Loop resistance	Ω	400 to 1800 (excluding terminals)
Polarity		Both wires a and b are negative regarding earth. In stand-by mode (on-hook) wire a is more negative than wire b. A positive tension can only be present while the call signal is being sent.

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On-hook without transmission	V	> 48±4
On-hook with transmission ²	V	> 43
Park condition		The line feed doesn't change while in park condition

3.2.2.2 Seizure

Off-hook detection	Level (mA)	> 6-10
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These values are always valid in respect to those established in the following table, which reports the recognition times of the direct current signals/criteria:

Call screening/ supervision	Signal certainly recognised (ms)	Signal certainly NOT recognised (ms)
On-hook (idle) condition	>250	<50
Hung up	>250	<100
Register recall	>25, <150	<15, >150

The reported values are only valid for callers. The person called can temporarily hang up for the time it takes to change the telephone jack.

3.2.2.3 Transmission

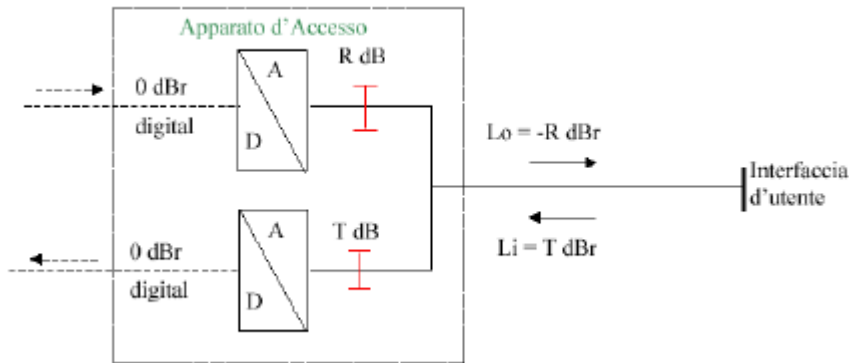
The user's interface is consistent with that specified in ITU-T Q.552. This is referred to in paragraphs 5.5.1 to 5.5.6 of [1].

The values of some transmission parameters are specified below.

3.2.2.3.1 Relative levels

The relative level is assumed to be 0 dB_r on the digital side of the analogue/digital conversion point in the local network.

² The on-hook tension is slightly reduced to allow CLI1 transmission

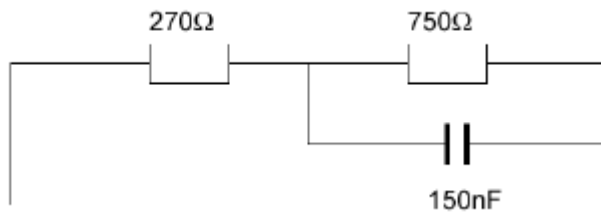


Apparato d'accesso = Access equipment
Interfaccia d'utente = User's interface

The nominal relative levels, at 1020 Hz, for the interface should be:
Relevant input level $L_i = 0 \pm 1 \text{ dBr}^3$
Relevant output level $L_o = -7 \pm 1 \text{ dBr}$

3.2.2.3.2 Reference impedance

The reference impedance of the POTS interface for the measure of the alternating currents of all the signals in the phonic band, is shown in the following illustration:



Function	Value
Nominal and balance impedance	$270\Omega . + 750\Omega . / 150 \text{ nF}$

³There may be some changes or particular approaches ($\pm 3\text{dBr}$) depending on the user's special requirements.

3.2.2.4 Supervisory tones

All the exchange tones presented have a frequency of 425 Hz (± 15) and a level of -15dBm (± 4). In the duration presented, the single tones (On and Off) have a tolerance of 10%

Tone	Cadence					
	On (s)	Off (s)	On (s)	Off (s)	On (s)	Off (s)
Dialling tone	0.2	0.2	0.6	1		
Call screening	1	4				
Engaged	0.5	0.5				
Congestion	0.2	0.2				
Call waiting	0.4	0.1	0.25	0.1	0.15	9

3.2.2.5 Decadic dialling

Decadic dialling is possible according to ETS 300 001.

The POTS network terminations include the reception of decadic dialling, depending on the following conditions:

- Frequency of pulses equal to 8-12 pulses
- The relation between opening time and closing time is equal to 1.6 ± 0.6 .
- Minimum pause duration > 200 ms

3.2.2.6 Multi-frequency dialling

The user's POTS interface supports the signalling of the user's multi-frequency or DTMF equipment, in accordance with the ETSI ETR 206 specification and those mentioned below:

	Relevant specifications
Dual Tone Multi-Frequency (DTMF) for POTS access	ETSI ES 201 235-1 Specification of Dual Tone Multi-Frequency (DTMF) transmitters and receivers; Part 1: general
	ETSI ES 201 235-2 Specification of Dual Tone Multi-Frequency (DTMF) transmitters and receivers; Part 2: transmitters

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	ETSI ES 201 235-3 Specification of Dual Tone Multi-Frequency (DTMF) transmitters and receivers; Part 3: receivers
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3.2.2.7 Ringing and Metering

Ringing	Level (Vrms)	> 65
	Frequency (Hz)	25 (±10%)
	DC offset (V)	30
	Total distortion	< 5%

Ringing – Form and duration	Immediate call	200 ÷ 1100 ms
	Pause between an immediate and periodic call	< 4.1 ms
	Periodic call	ON: 1000 +/- 100 ms OFF: 4000 +/- 100 ms

The ring tone is also removed within a maximum time of 250ms from the recognition of the off-hook tone.

The limitation of the current conforms to ETSI EN 60950

Metering		NA⁽²⁾
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⁽²⁾ Wind doesn't apply this type of tariff

3.2.2.8 Supplementary services

	Standard specifications
Service identifying the caller's line for POTS users	ETSI EN 300 659-1 Public Switched Telephone Network (PSTN) subscriber line protocol over the local services: part 1: on-hook data transmission

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	ETSI EN 300 659-2 Public Switched Telephone Network (PSTN) subscriber line protocol over the local services; part 2: off-hook data transmission

3.3 DIGITAL INTERFACES

3.3.1 ISDN BRI

The ISDN BRI service is offered via an NT system, in keeping with the technical specification n. 767 ISCTI. This has the following characteristics:

- U interface linked up through a screw connector
- S0 interface with two RJ 45 ports
- (Optional) Two RJ 11 analogue interface ports (see para. 3.2 and ref [2])
- Switch to select “emergency mode” (ab/S0 ports) and the BUS S type (short/extended)
- Telephone power supply: min.40 Volt
- Power supply 230 V AC

The standard specifications are listed, including the supplementary services

3.3.1.1 Physical level:

reference point U	TS 102 080 (Ex ETR 080)
bus S	ETS 300 012
a/b interfaces (voice)	ITU-T Q.552
remote power supply	± 40 V _{dc}

3.3.1.2 Signalling

Link layer	ETS 300 125
Basic call control	ETS 300 102-1
Generic keypad protocol	EN 300 122-1
Generic functional protocol	EN 300 196-1
Incoming call management	ETS 300 082
Multiple Subscriber Number (MSN)	EN 300 052-1
Terminal Portability (TP)	EN 300 055-1
Call Waiting (CW)	EN 300 058-1
Calling Line Identification Restriction (CLIR)	EN 300 093-1
Connected Line Identification Presentation (COLP)	EN 300 097-1

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Connected Line Identification Restriction (COLR)	EN 300 098-1
Malicious Call Identification (MCID)	EN 300 130-1
Call Hold (HOLD)	EN 300 141-1
Three-Party (3PTY)	EN 300 188-1
Diversion supplementary services (CFU, CFNR, CFB)	EN 300 207-1
Explicit Call Transfer (ECT)	EN 300 369-1
CLI Services (on-hook)	ETS 300 659-1
CLI Services (off-hook)	ETS 300 659-2

3.3.1.2 EMC & Safety

Safety	EN 60950
EMC and protection	EN300386 V1.3.2, EN55022, EN 55024, ITU-T K.21, Interface U K21 6 KV Interface S K21 1 KV Interface a/b K21 1 KV ETS 300 386-2-2 ETS 300 047-5

3.3.2 ISDN PRI

The ISDN PRI service conforms to the following European standards:

Layer 1	ETSI ETS 300 011-1 ETSI ETS 300 233
Layer 2	ETSI ETS 300 125
Layer 3	ETSI ETS 300 102-1

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3.3.3 Interface Data

Data interfaces are offered through NT, which use the following network side interfaces:

- HDSL interface, according to ETSI ETR152
- PDH/SDH or radio interface (see para. 3.3.4)
- ADSL interface, according to recommendation ITU-T G992.1/.2 (ETSI TS 101 388)

Circuit	Power level	Connectors	Notes
V.11	V.11, V.36	ISO 4902, EIA RS449	
V.24	V28	ISO 2110, EIA RS232-D	
V.35	V.35	ISO 2593	
X.21	V.11	ISO 4903	
G.703/64k	G.703	ISO 4903 ⁴	
G.703/2M- G704	G.703	ISO 4092 ⁵ , SMB BNC, RJ45	
Ethernet Fast Ethernet	IEEE 802.3 ISO IEC 8802-.3	10/100 BaseT-RJ45	ADSL network side ⁶
USB	USB 1.x ⁷		ADSL network side

To mechanically define the connector and establish the correspondence of the pin with the interface criteria, go to Annex 1.

3.3.3.1 EMC & Safety

The NT for data interfaces will satisfy the following EMC requirements:

EN 55022 Class B (1998)

EN 55024 (1998)

ETS 300 386 1 (1994)

EN 300 386 2

⁴ G703 doesn't specify the connector. The D-15 pin connector is normally used

⁵ Normally a D-9 pin connector is used (symmetrical, 120Ω), coaxial (asymmetric, 75Ω) SMB or RJ45 according to the details in the Annex

⁶ RJ11 connector

⁷ www.usb.org, industrial standard

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Safety:

EN 60950 (1993) (Electrical safety)

EN 61000-4-5 (Surge protection)

3.3.4 PDH-E SDH INTERFACES

Interface	Reference specification	Structure⁸
E1	G.703	G.704, G706
E3	G.703	
STM-1 electric	G.703	G.707
STM-1 optics	G.957	G.707
STM-4	G.957	G.707
STM-16	G.957	G.707
STM-64	G.691	G.707


⁸ If present

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4. ANNEXES

1.	Mechanical and electrical description of low speed data interfaces	 Allegato1.doc
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