



**swisscom**

**From**  
**Date** 30 September 2017  
**Subject** Interface properties of the analogue network interface

**Distributed to**  
**For**  
**information**

## Interface properties of the analogue network interface

<b>Scope</b>	
<b>Doc. ID</b>	
<b>Version</b>	1.0
<b>Status</b>	
<b>Replaces version</b>	
<b>Date of issue</b>	
<b>Valid from</b>	
<b>Valid until</b>	
<b>Document name</b>	2017-09-30_GV18_Schnittstellenspec_Analog_V1.0_en
<b>File</b>	
<b>Archiving</b>	

**Only the german version counts for reference!**



**swisscom**

**Contents**

- 1 Introduction ..... 3
  - 1.1 Object and purpose ..... 3
  - 1.2 Scope ..... 3
  - 1.3 Target audience and requirements of reader ..... 3
  - 1.4 Terms and abbreviations ..... 3
  - 1.5 Referenced documents ..... 4
- 2 Location of interface ..... 5
- 3 Interface properties at the NTP ..... 6
- 4 CLIP, CNIP and MWI PSTN display services ..... 10
  - 4.1 Subscriber signalling ..... 10
    - 4.1.1 Subscriber line protocol; Part 1: On-hook data transmission ..... 10
    - 4.1.2 Subscriber Line Protocol; Part 3: Data link message and parameter codings ..... 10
  - 4.2 Services ..... 11
    - 4.2.1 Calling Line Identification Presentation (CLIP) and Calling Name Identification Presentation (CNIP) ..... 11
    - 4.2.2 Message Waiting Indication MWI ..... 11



# swisscom

## **1 Introduction**

### **1.1 Object and purpose**

This document describes the physical properties of the analogue network interface at the network termination point.

### **1.2 Scope**

The content of this document is valid for the Swisscom analogue network interface at a Swisscom network termination device.

### **1.3 Target audience and requirements of reader**

This document is directed at manufacturers of analogue end devices.

### **1.4 Terms and abbreviations**

ALASS	Analogue local access signalling services
BEP	Building entry point (outdated: network separation point [NSP])
CLIP	Calling line identification presentation
CNIP	Calling name identification presentation
DD	DSL digital socket
TE	Terminal equipment
FXS	Foreign exchange station (analogue subscriber line at an NTU)
LF	Loading factor
MWI	Message waiting indication
NTP	Network termination point
NTU	Network termination unit
OTO	Optical telecommunications outlet
PSTN	Public switched telephone network
SMS	Short message service



**swisscom**

**1.5 Referenced documents**

- [1] ETSI ES 201 970 V1.1.1 (2002-08)  
Access and Terminals (AT); Public Switched Telephone Network (PSTN); Harmonized specification of physical and electrical characteristics at a 2-wire analogue presented Network Termination Point (NTP)
- [2] ETSI TBR 21; 01.1998  
Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual-Tone Multi-Frequency (DTMF) signalling
- [3] ETSI TBR 38; 05.98  
Public Switched Telephone Network (PSTN); Attachment requirements for a terminal equipment incorporating an analogue handset function capable of supporting the justified case service when connected to the analogue interface of the PSTN in Europe
- [4] 2017-09-30\_GV18\_Hausinstallation  
Technical and physical requirements for home installation for the provision of public telephone service and Internet access via a copper or fibre-optic connection
- [5] ITU-T Q.552 (11/2001)  
Transmission characteristics at 2-wire analogue interfaces of digital exchanges
- [6] ETSI EN 300 659-1 V1.3.1 (2001-01)  
Accesses and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services: Part 1: On-hook data transmission
- [7] ETSI EN 300 659-3 V1.3.1 (2001-01)  
Accesses and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services: Part 3: Data link message and parameter codings

2 Location of interface

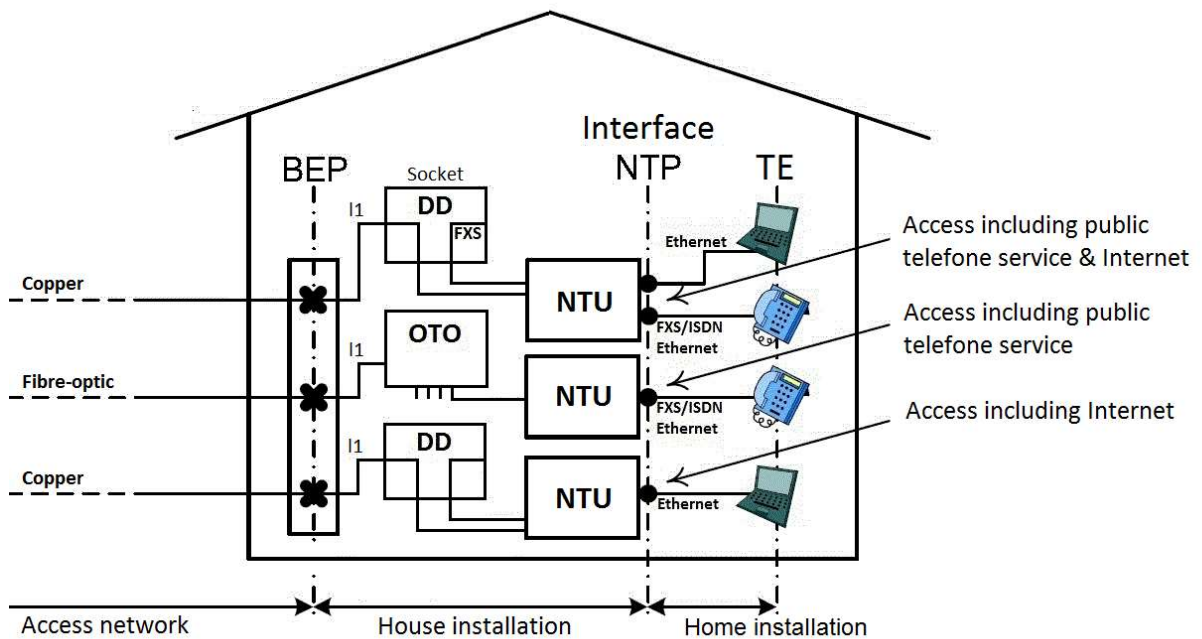


Figure 1: Location of interface

The interface properties specified in Section 3 refer to the NTP. The requirements for house installation are specified in [4]. The data at the NTP specified in Section 3 are only valid if the house installation meets the requirements in [4].



### 3 Interface properties at the NTP

[1] serves as a basis. Only the deviations from [1] are listed.

Section of [1] ES 201 970	Values/remarks
<b>4 General</b>	The interface supports end devices as per TBR 21 [2] and TBR 38 [3].
<b>5 Physical connections</b>	
5.1 Mechanical aspects	The analogue network interface at the NTU corresponds to the NTP. The connector systems RJ11 or RJ45 are used.
5.2 Support of more than one terminal	The interface supports a minimum of an LF of 100, i.e. one terminal as per TBR 21 [2] or TBR 38 [3]. If additional terminals are connected in parallel, successful functioning cannot be guaranteed.
<b>6 DC feed condition</b>	
6.1 Polarity	Corresponds to [1]
6.2 Quiescent state	
6.2.1 Maximum voltage	Corresponds to [1]
6.2.2 Minimum voltage	Corresponds to [1] The LF is 100 (i.e. the measurement is carried out with a resistance of 1 MΩ).
6.2.3 Supply interruption	Supply interruptions can be longer than 10 sec., for example when the NTU is restarted or in the event of a power failure. The NTU has no backup battery.
6.3 Loop current	
6.3.1 Loop current range	Corresponds to [1]
6.3.2 Loop current interruptions caused by the end device	Loop current interruptions (current < 1 mA) from 0 to 12 ms do not result in any changes to the NTP.
<b>7 Seize signal</b>	
7.1 Must not seize condition: current	Corresponds to [1]
7.1 Must not seize condition: time	A loop closure of 0 to 5 ms is not detected as busy state.



Section of [1] ES 201 970	Values/remarks
7.2 Must seize condition: current	A current of $\geq 15$ mA is detected as busy state.
7.2 Must seize condition: time	Corresponds to [1]
<b>8 Clear signal</b>	
8.1 Clear signal generated by TE a) Shall not accept	An interruption of $< 200$ ms is not detected as loop opening.
8.1 Clear signal generated by TE b) Shall accept	Corresponds to [1]
8.1 Clear signal generated by TE For the called party	0 to 4 min.
8.2 Clear indication from the network	Corresponds to [1]
8.3 Seizing the line for a new call	Corresponds to [1]
<b>9 Impedance</b>	
9.1 NTP impedance	Corresponds to [1] within the range of 300 to 3400 Hz
9.2 Balance about earth	Corresponds to [1] within the range of 300 to 3400 Hz
<b>10 Transmission</b>	
10.1 Relative level	Input relative level = $+3 \pm 2.5$ dBr Output relative level = $-10 \pm 2.5$ dBr
10.2 Frequency response	Corresponds to [1]
10.3 Coding law	Corresponds to [1]
10.4 Noise	Corresponds to [1]
10.5 Maximum input levels	3.14 dBm
10.6 Stability	Corresponds to [1]
10.7 Crosstalk	Corresponds to [1] in accordance with [5]
<b>11 DTMF dialling</b>	Corresponds to [1]
<b>12 Ringing</b>	
12.1 Ringing drive capability	



<b>Section of [1] ES 201 970</b>	<b>Values/remarks</b>				
12.1.1 Ringing frequency	Frequency $25 \pm 3$ Hz				
12.1.2 Ringing voltage	Corresponds to [1]				
12.1.2.1 Ringing with DC	Corresponds to [1]				
12.1.2.2 Ringing without DC	Corresponds to [1]				
12.2 Ring cadence	Corresponds to [1] Normal ring: ring $1,000 \pm 100$ ms, pause $4,000 \pm 400$ ms Ringback: ring 400 ms, pause 400 ms, ring 400 ms, pause 400 ms, ring 400 ms, pause 3 sec. (all cadences $\pm 10\%$ )				
12.3 Ring trip	Corresponds to [1]				
<b>13 Supervisory signals</b>					
13.1 Supervisory tones	The following tones are available: a) Dial tone b) Ringing tone c) Busy tone d) Congestion tone, release tone e) Special dial tone 1 f) Special dial tone 2 g) Special information tone h) Call waiting tone				
13.2 Tone levels and 13.3 Cadence and frequencies	<b>Tone</b>	<b>Cadence</b>		<b>Frequency</b>	<b>Level</b>
	a)	Continuous		$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -14.7 dBm
	b)	1 sec. on	4 sec. off	$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -19.7 dBm
	c)	0.5 sec. on	0.5 sec. off	$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -19.7 dBm
	d)	0.2 sec. on	0.2 sec. off	$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -19.7 dBm
	e)	Continuous		$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -14.7 dBm
		1.1 sec. on	1.1 sec. off	$340 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -19.7 dBm
	f)	0.5 sec. on	0.05 sec. off	$425 \text{ Hz} \pm 15 \text{ Hz}$	-6.2 to -19.7 dBm





Section of [1] ES 201 970	Values/remarks				
	g)	3 × 0.33 sec. on	1 sec. off	950 Hz 1,400 Hz 1,800 Hz Tolerance ± 50 Hz	−23.2 to −34.7 dBm
	h)	0.2 sec. on 0.2 sec. on	0.2 sec. off 4 sec. off	425 Hz ± 15 Hz	−17.2 to −28.7 dBm
	Tolerance of cadence ± 10%				
Remark on supervisory signals	The requirements outlined in this section apply only to tones produced in the equipment serving the NTP. Example: The special information tone is usually generated as part of an announcement in the network. In this case, this tone may have other properties.				
<b>14 Optional functions</b>					
14.1 Loop disconnect dialling	Not supported				
14.2 Register recall	Corresponds to [1]				
14.3 Metering	Not supported				
14.4 ALASS services	The following services are supported: CLIP, CNIP, optionally MWI. See Section 4 for details.				
14.5 Polarity reversal	Option not available				
14.6 End-of-call signal (K break)	Not supported				



**swisscom**

## **4 CLIP, CNIP and MWI PSTN display services**

### **4.1 Subscriber signalling**

Via the analogue network interface at the NTP, the service “Display Services PSTN” facilitate the transfer of information that can be depicted on the display of a corresponding end device.

Data transfer for the additional services CLIP (Calling Line Identification Presentation), CNIP (Calling Name Identification Presentation) and MWI (Message Waiting Indication) can take place in one direction only, from the network to the subscriber.

Data transfer takes place as per [6] (on-hook). The signalling protocol to be used is defined in [7].

#### **4.1.1 Subscriber line protocol; Part 1: On-hook data transmission**

[6] applies with the following detailed definitions:

Section 5.2: 180 ±25 “mark bits” are sent.

Section 6.1.2: “Data transmission prior to ringing” is not used.

Section 6.2: Data transmission not associated with ringing

– 6.2 a): DT-AS is used.

– 6.2 b): RP-AS is not used.

– 6.2 c): Line reversal followed by DT-AS is not used.

Section 6.3: TAS physical characteristics

– 6.3.1: DT-AS is used.

– 6.3.2: RP-AS is not used.

Annex B is not used.

#### **4.1.2 Subscriber Line Protocol; Part 3: Data link message and parameter codings**

[7] applies with the following detailed definitions:

Section 5.2: The following messages are used:

Section 5.2.1: Call Setup message

Section 5.2.2: Message Waiting Indication message

Sections 5.3 and 5.4: Only the following parameters are used:

Section 5.4.1: Date and Time

Section 5.4.2: Calling Line Identity

Section 5.4.4: Reason for Absence of Calling Line Identity



**swisscom**

Section 5.4.5: Calling Party Name parameter

Section 5.4.6: Reason for Absence of Calling Party Name parameter

Section 5.4.7: Visual Indicator

Section 5.4.8: Message Identification

Section 5.4.9: Last Message CLI

Section 5.4.14: Number of Messages

## **4.2 Services**

### **4.2.1 Calling Line Identification Presentation (CLIP) and Calling Name Identification Presentation (CNIP)**

CLI/CNI is transmitted to the subscriber between the first and second ring, as per [6] Section 6.1.1.

Only one CLI is transmitted to the subscriber. If two CLIs are available, only the “user-provided not screened number” (“additional calling party number”) is transmitted.

### **4.2.2 Message Waiting Indication MWI**

With the additional MWI service, an indication is transmitted to the subscriber if a message has been recorded in their voicemail (e.g. Combox).

The identification is only transmitted if the provider of the voicemail supports this service.

[6] Section 6.2 “Data transmission not associated with ringing” applies when transmitting MWI information to the subscriber.