



# **T** ELENOR

# **S**PECIFICATION

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## **FSK signalling towards analogue PSTN interfaces**

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**Abstract**       : Specification describing the network side of the PSTN access for FSK-signalling towards the subscriber used for “calling line identification” (CLIP), “call waiting” (CW) and “message waiting” (MW).

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## 1 Scope

This specification describes the requirements related to the use of the FSK signalling protocol for display related services in the Telenor network within the Norwegian market. This document is based upon Telenor Nett internal specifications as well as the official ETSI specifications for the related functions (see references).

In no event shall Telenor be liable to other parties for any direct, indirect, special, incidental, or consequential damages resulting from errors or defects in these specifications.

## 2 References

### 2.1 Normative references

1. Message waiting indication (MWI) network signalling (specification NU/960820, rev. 1)
2. ETSI EN 300 659-1 V1.3.1 (2001-1). "Access 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"
3. ETSI EN 300 659-2 V1.3.1 (2001-1). "Access 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 2: Off hook data transmission"
4. ETSI EN 300 659-3 V1.3.1 (2001-1). "Access 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"
5. Telenor Nett Specification A21: "Access to the public switched telephone network (PSTN). Specification of the network side of the user-network interface." (December, 1997.)

### 2.2 Informative references

None

## 3 Definitions and abbreviations

None

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## 4 Terminal alerting signal

### 4.1 Calling line identification for normal call

Data transmission during ringing (ref. § 6.1.1 of ETSI EN 300 659-1 V1.3.1) will be used as a standard method in the Telenor network in relation to the supplementary service “Calling Line Identification Presentation” (CLIP) for PSTN users. The first burst of the ringing signal will be the terminal alerting signal. Data transmission will take place in the pause between the first and the second burst of the ringing signal.

For information about Telenor specific ringing attributes, see Telenor Nett Specification A21 <ref. 4>.

### 4.2 Calling line identification for Call Waiting

In connection with the supplementary service “Call Waiting” (CW), data transmission in off-hook state (ref. ETSI EN 300 659-2 V1.3.1) is required. The procedures and the terminal alerting signal shall be according to ETSI EN 300 659-2 V1.3.1, § 6.1.

### 4.3 Message Waiting Indication

In connection with the supplementary service “Message Waiting Indication” (MWI), data transmission not associated with ringing is required (ref. § 6.2 of ETSI EN 300 659-1 V1.3.1). The terminal alerting signal will in this case be according to § 6.2.c, of ETSI EN 300 659-1 V1.3.1 (“line reversal followed by a DT-AS”). This service is not yet available in the network.

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## 5 Data transmission

### 5.1 Calling line identification

#### 5.1.2 Normal call

Table 1 gives an overview of the ETSI specified parameters (ref. ETSI EN 300659-3 V1.3.1), which are implemented in Telenor Networks switches, and supported by the destination local exchange in order to provide the FSK data to the display equipment when receiving an incoming call.

Parameter Name	Mandatory	Ref. ETSI EN 300 659-3 V1.3.1
Date and Time	X	§ 5.4.1
Calling Line Identity or Reason for absence of Calling Line Identity	X	§ 5.4.2
	X	§ 5.4.4

Table 1

#### 5.1.2 Call Waiting

The parameters listed in table 1 will also be used for incoming calls related to the call waiting supplementary service. If the served user of CLIP is already involved in a call and has the “call waiting” supplementary service active, presentation of the calling line identification for a new incoming call shall be based on ETSI EN 300 659-2 V1.3.1 (2001-1). (“Off hook data transmission”).

The characteristics of the call waiting indication tone are as follows:

- frequency: 425 ± 15 Hz
- cadence: 200 ms tone/600 ms pause/200 ms tone/10.000 ms pause
- level: the level, depending on the length of the subscriber line, will be between -37 and - 25 dBm.

The invocation procedure for CLIP related to call waiting shall be as follows:

1. First burst of the call waiting indication tone is sent to the subscriber (200 ms tone +600 ms pause +200 ms tone)
2. In the first 10.000 ms pause of the call waiting tone, the CLIP data shall be transmitted, after a preceding TE alerting signal according to ETSI EN 300 659-2 V1.3.1 (2001-1).

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## 5.2 Message Waiting Indication

Ref. section 4.3 of this document. Mapping of the message waiting indication service into the FSK protocol is not generally applicable in Telenor Networks switches.

## 6 Return indication

Any return signal, given by the terminal equipment, to indicate successful/not successful data transmission, will be ignored by the network.

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