



Telenor SIM specification

General Purpose Telematics (GPT)

Profile no: 004



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1. Template revisions

Template revision is only updated when the original template is modified. Revision version is then updated in whole number. I.e. 1.0 is updated to 2.0 etc.

| Ver. | Date | Author | Comment / Modification |
|------|------------|------------------------------------|---|
| 1.0 | 2007-04-13 | Henrik Samuelsson | New template |
| 2.0 | 2007-05-29 | Henrik Samuelsson | New version, reference 16 |
| 3.0 | 2007-12-20 | Henrik Gunnarsson | New component and new application added |
| 4.0 | 2008-01-09 | Henrik Samuelsson | Update item 7 and 10, removed OX18 and OX25 |
| 5.0 | 2008-01-18 | Henrik Samuelsson | Update item 10.7 |
| 6.0 | 2008-01-22 | Henrik Samuelsson | Update item 10.3.2.1 |
| 7.0 | 2009-03-17 | Henrik Samuelsson/Henrik Gunarsson | General update |
| 8.0 | 2009-12-17 | Mikael Kihlbert | Update item 7, Bluefish and Gemalto OS added as choices for VQFN8 sim |

2. Customer revisions

Customer revision is updated when customers requirements needs to be modified in this SIM specification. The first digit in the customer revision is defined by the template revision and the second digit is incremented by 1.

Example. Template revision is 3.0 and this is the first official SIM specification for the customer then the customer revision is defined as 3.1. If the customer makes changes in the specification then the second digit is incremented by 1 i.e. 3.2 etc.

| Ver. | Date | Author | Comment / Modification |
|------|------------|-------------------|---|
| 7.1 | 2009-08-21 | Henrik Gunnarsson | New profile, identical to Telenor GPT on Ox24 but with different printing and different prefix. |
| 7.2 | 2009-10-26 | Henrik Gunnarsson | Added IMSI information and information regarding Assisted roaming. |
| 7.3 | 2009-11-09 | Mikael Kihlbert | New GPT for VQFN8 sim and +467190 number series |
| 8.1 | 2009-12-17 | Mikael Kihlbert | Gemalto OS selected for VQFN8 sim, MSISDN of SIM set in MSISDN file contents in item 10.2.2.2 |
| 8.2 | 2009-12-18 | Mikael Kihlbert | Correction of ICCID prefix and sim profile no in item 6. Correction of ICCID in item 11.2. |

3. General

This document describes the specific features of SIM cards and SIM parameter files for the customer. For general features, see references 1-15 (Industry standards) and reference 16-20 (Telenor standards).

4. Terminology

| | |
|---------------|--|
| GSM | Global System for Mobile communication |
| NA | Not Available |
| PIN | Personal Identification Number |
| PUK | PIN Unblock Code |
| SIM | Subscriber Identity Module |
| USIM | Universal Subscriber Identity Module |
| SMS | Short Message Service (see ref [13]) |
| SMSC | Short Message Service Centre |
| TBD | To Be Defined (a parameter in this document that is not defined yet) |
| CSD | Circuit Switched Data |
| CSD MO | Circuit Switched Data Mobile Originated |
| CSD MT | Circuit Switched Data Mobile Terminated |
| HSCSD | High-Speed Circuit Switched Data |
| GPRS | General Packet Radio Service |
| APN | Access Point Name |

| | |
|-------------|--|
| EDGE | Enhanced Data rates for Global Evolution |
| UMTS | Universal Mobile Telecommunications System |

| | |
|------------------|---|
| FDN | Fixed Dialling Numbers |
| ADN | Abbreviated Dialling Numbers |
| ICCID | Integrated Circuit Card Identity (the serial number of the SIM) |
| IMEI | International Mobile Equipment Identity |
| MSISDN | Mobile Station ISDN number (i.e. the telephone number) |
| PLMN | Public Land Mobile Network |
| FPLMN | Forbidden Public Land Mobile Network |
| Plugin | The small punched out part of the SIM |
| Card body | The plastic part of the SIM card |
| BDN | Barred Dialling Numbers |
| SDN | SIM card Dialling Numbers |
| SPN | Service Provider Name |
| ADN | Abbreviated Dialling Numbers |
| IMEI | International Mobile Equipment Identity |
| OTA | Over the Air, i.e. the process of communicating with the SIM over the radio interface. This can be used for managing/updating parts of the SIM profile post issue, when the SIM is used by the subscribers. The possibilities for this must be configured during the personalisation. |
| WIG | Wireless Internet Gateway, a server application which can hold variable content, accessible from the SIM, through OTA communication |
| WIB | Wireless Internet Browser, a script engine on the SIM, which can be used to browse contents on a WIG, or to execute scripts stored in files on the SIM |
| PCB | Printed Circuit Board. |
| SMD | Surface Mounted Device. A device that can be soldered to a PCB. |
| QFN | Quad Flat No leads, a type of SMD device. Sometimes also called MLF. |
| MLF | Micro Lead Frame. |
| VQFN8 | A type of QFN device, with 8 connections. |

5. Part Number / Article Number

If you have an internal part number or article number, you wish to identify this specific version of SIM card and profile with, please state it here.

One of the options below shall be selected.

- Customer part number is (maximum 8 characters long)
 No part number is used (default value)

6. SIM Prefix and Telenor Article Number (Telenor Sweden input)

The serial number of the SIM, also referred to as ICCID or SIM Number, is 20 digits long. The first 6 digits are always 894608, where 89 is an industry standard for SIM cards, 46 is the country code for Sweden, and 08 is identifying the Telenor Connexion network. The following 3 digits are identifying the SIM profile to be used, and are referred to as the SIM Prefix. The last digit is a checksum calculated with the Luhn algorithm. The other digits form a serial number, and are often just incremented as a counter. The ICCID prefix is defined by Telenor.

The SIM cards have ICCID prefix **8946080004**

The SIM cards have **+467190 MSISDN** number series in Telenor Connexion HLR

The SIM cards have **24008 IMSI** range in Telenor Connexion HLR

The SIM cards use CXN AUC

The profile have Telenor CXN reference number **004**

7. Component

There are one standard component used for Telenor Connexion (U)SIM cards. The standard components which are normally used are the following:

- OX24 SIM Card, based on Samsung S3CC9NC, with 64K EEPROM memory and support for GSM and UMTS, ref. 19. (default value)
 OX18 SIM Card, based on Samsung S3CS9SB, with 64K EEPROM memory and support for GSM and UMTS, ref. 17.

- VQFN8, SMD SIM module, based on Infineon SLM76CF3601P with 360 K EEPROM memory and support for GSM and UMTS (ref. 20) with Bluefish OS
- VQFN8, SMD SIM module, based on Infineon SLM76CF3601P with 360 K EEPROM memory and support for GSM and UMTS (ref. 20) with Gemalto OS

New SIM card types are to be verified and officially released by Telenor with an appropriate test protocol. Before new SIM cards (including new chipsets, profiles or modules) are to be used according to this agreements these must be communicated in advance (at least two months in advance) to the customer by Telenor.

For detailed SIM profile description, see specifications in Ref. 17, 19, and 20, depending on the selection of component. In addition to what's stated in those documents and what is stated below, the assisted roaming application will always be switched off for Telenor Connexion.

8. Artwork

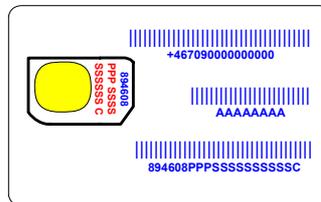
For Telematics, white card bodies are used for cards, and black VQFN8 modules are used for SMD SIM's.

9. Visual personalisation

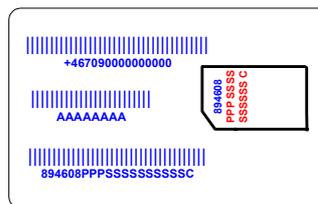
Thermo transfer of card unique information can be made in black, on the card body during personalisation. Limited space and moderate resolution give limitations to what is practical. Some common options are listed, but alternatives can be discussed. Printing can be done on any side, but normally not on both sides. The red text in the images below marks the mandatory printing for the selected option; the blue marks some commonly used optional fields. All printing is in black. The standard font is 7 points Arial Bold, but alternative fonts can be discussed. On the plug-in there can be a maximum of 8 characters per line, and up to 3 lines. On the card body there can be up to 3 barcodes, with up to 20 characters per barcode, if white card bodies, or card bodies with a minimal artwork is used. Default barcode coding is Code128, but alternative codes can be discussed.

If not SMD, One of the options below shall be selected.

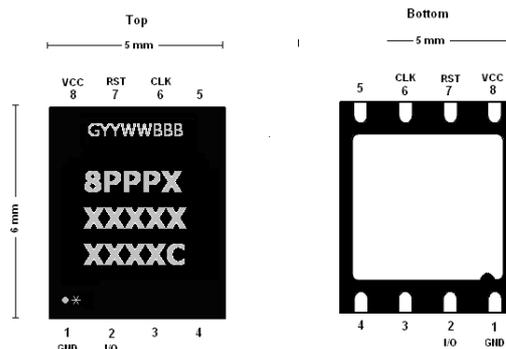
- All print shall be on the front (chip contact) side of the card body (default)



- All print shall be on the rear side of the card body



If VQFN8, the print on the module top will be this.



GYWWBBB is the Infineon batch number. YYWW will be replaced by the manufacturing year and calendar week of the module, and BBB is a batch number.
8PPPXXXXXXXXXXC are the last 15 digits of ICCID, where PPP is the ICCID prefix, XXXXXXXXXXX is an incremented serial number, and C is the ICCID check digit.

The dot and star at the bottom left shows the orientation of the module and marks the orientation of PIN 1.

9.1 Print on the Plug in

The plug in is in most cases the only part of the SIM that is installed in the terminal, and therefore it's important to have sufficient tracking information on it. Normally only the last 14 digits of ICCID are printed, but if the font is small enough, it is possible to have 3 lines with 7 digits each.

If not SMD, One of the options below shall be selected.

- The last 14 digits of ICCID shall be printed in 2 lines (default)
- All 20 digits of ICCID shall be printed in 3 lines
- Part number shall be printed in one line, above 2 lines containing the last 14 digits of ICCID (This option only available if part number was defined in chapter 5)

9.2 Print on the card body

On the card body there's more space available, and it's also possible to print i.e. barcodes, or simple logos, in black.

If not SMD, At least one of the options below shall be selected.

- No print on the full size card body (default)
- All 20 digits of ICCID shall be printed as Code 128 bar code
- MSISDN shall be printed as Code 128 bar code
- Part number shall be printed as Code 128 bar code
- PIN1
- PUK1
- PIN2
- PUK2
- Customized printing shall be made as specified **Telenor Connexion logo**

10. SIM Profile

This section describes the differences from the Telenor standard profile for the selected component.

10.1 Security

10.1.1 PIN1

PIN1 protection restricts usage of the SIM, and is a protection against fraud. The best security level is obtained by using a random PIN1. However, for Telematic solutions it is common to disable the PIN1, since it is practical in many solutions not to enter PIN1 every time the Telematic module is powered on. How ever disabling the PIN1 lowers the security of the SIM card. If the card is stolen or removed from the unit it can be used by anyone. A compromise is to use a fixed PIN, identical on all SIM cards, which makes it possible to hard-code the PIN in the terminal software. Which level you choose should be determined with consideration of the overall protection of the application.

One of the options below shall be selected.

PIN1 Disable allowed?

- Yes (This is the most common option. It makes it possible to disable the PIN1 from start, or at a later stage, after verification of PIN1.)
- No (This option makes it impossible to switch off the PIN1 protection, even if you know the PIN. It is set at a very early stage of personalisation, and has effect on the remaining parts. Therefore it causes some additional development costs.)

If you have selected yes above, One of the options below shall be selected.

PIN1 Disabled:

- Yes

- No

One of the options below shall be selected.

PIN1 Value:

- Fixed PIN, Value = **1111** (normally 4 digits, but up to 8 is possible)
 Random PIN (always 4 digits)
 Last 4 in IMSI
 Last 4 in ICCID

10.1.2 PUK1

PUK1 is used to unblock the PIN1. If you have entered PIN1 incorrect 3 times you will need to unblock it. You have 10 attempts to unblock. If you fail, the card is lost.

One of the options below shall be selected.

- Random PUK (Default)
 Fixed PUK, Value = (8 digits)
 Last 8 in IMSI
 Last 8 in ICCID

10.1.3 PIN2

PIN2 is an extra level of security used for some SIM-features such as Fixed Dialing Numbers (FDN).

One of the options below shall be selected.

- Random PIN (always 4 digits)
 Fixed PIN, Value = (normally 4 digits, but up to 8 is possible).
 Last 4 in IMSI
 Last 4 in ICCID

10.1.4 PUK2

PUK2 is used to unblock the PIN2. If you have entered PIN2 incorrect 3 times you will need to unblock it. You have 10 attempts to unblock. If you fail, the SIM-features requiring PIN2 will be lost.

One of the options below shall be selected.

- Random PUK2 (default)
 Fixed PUK2, Value =
 Last 8 in IMSI
 Last 8 in ICCID

10.2 Phonebook

All files in the phonebook are containing a number of records with fixed length. The last 14 bytes of the records are used to store the phone numbers, including number type and international prefix. The remaining bytes are called the alpha-tag, and can be used when searching the contents of the file. The file sizes can be customized within available memory space, but customization generates implementation and testing costs at project start up.

10.2.1 SDN, Service Dialling Numbers

SDN numbers can be read by the terminal after PIN1 verification, but never updated by the end user, only via SIM-OTA downloads. The purpose of this file is to store service numbers that the users cannot remove or change. Typically the numbers for customer services are stored here.

10.2.1.1 SDN, File structure

The default values of number of SDN records are:

Ox24: 10 records of 32 bytes each with 18 characters in a-tag.
Ox18: 10 records of 34 bytes each with 20 characters in a-tag.
VQFN8: 10 records of 32 bytes each with 18 characters in a-tag.

If customer has requirements for more numbers of SDN-records, then use the option below.

- There shall be space for SDN records
(This will generate extra development time, and cost)

10.2.1.2 SDN file contents

One of the options below shall be selected.

- SDN shall be empty (default)
 - SDN record a-tag number
- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10

10.2.2 MSISDN, Phone number

The MSISDN file can be read and updated after PIN1 verification. The purpose is to store the phone number of the SIM. It can have several records, since there can be different numbers for voice, data, fax, etc. The a-tag in that case can be used to explain what type of number is stored at the specific record.

10.2.2.1 MSISDN File structure

The default values of number of SDN records are:

- Ox24: 3 records of 24 bytes each with 10 characters in a-tag.
- Ox18: 1 records of 34 bytes with 20 characters in a-tag.
- VQFN8: 3 records of 24 bytes each with 10 characters in a-tag.

If customer has requirements for more numbers of SDN-records, then use the option below.

- There shall be space for records
(This will generate extra development time, and cost.)

10.2.2.2 MSISDN file contents

One of the options below shall be selected.

- MSISDN shall be empty
 - MSISDN record a-tag number
- 1 **MSISDN of SIM (default)**
 - 2
 - 3

10.2.3 ADN, Abbreviated Dialling Numbers

ADN numbers can be read and updated by the terminal after PIN1 verification. The ADN file can never be active together with the FDN file.

One of the options below shall be selected.

- The SIM shall be in ADN mode (default)
- The SIM shall not be in ADN mode (mark this option if FDN shall be active & then go to chapter 10.2.4)

10.2.3.1 ADN File structure

The default values of number of ADN records are:

- Ox24: 200 records of 32 bytes each with 18 characters in a-tag.
- Ox18: 200 records of 44 bytes each with 30 characters in a-tag.
- VQFN8: 200 records of 32 bytes each with 18 characters in a-tag.

If customer has requirements for more numbers of ADN-records, then use the option below.

- There shall be space for records (max 254) (This will generate extra development time, and cost.)

10.2.3.2 ADN file contents

Pre-personalization of phonebook entries.

One of the options below shall be selected.

- ADN shall be empty
 - ADN record a-tag number
- 1
 - 2

Record 2

Empty

10.3.2.2 Content of the pre-defined customer SMS settings

Only valid if customized SMS settings have been defined in chapter 10.3.2.

- Customized settings
Name:
Destination Address:
Service Centre:
Protocol Indicator:
Data Coding Scheme:
Validity period:

Record 2

- Empty
- Customized settings
Name:
Destination Address:
Service Centre:
Protocol Indicator:
Data Coding Scheme:
Validity period:

10.4 PLMN list

The PLMN list is a priority list for selecting roaming networks, when abroad. The default Telenor list is defined in order to get the most cost effective roaming solution.

One of the options below shall be selected.

- Empty PLMN list shall be used (**default**)
- Specific PLMN list shall be used, the contents shall be according to the list in Appendix of the agreement (this generates extra development time, and cost)

10.5 SPN, Service Provider Name

This feature offers a possibility to display the customers brand in the terminal display. The Service provider name is a text which can be displayed in the display of the handset. It can be displayed either together with the network, or replacing the network. If it is together with the network, the actual network is always shown. In Sweden the SPN and Telenor SE is displayed together, and when roaming, the actual network and the SPN are shown. If it is replacing the network, it replaces Telenor SE in Sweden, but when roaming abroad, it is replaced by the actual network.

10.5.1 SPN file structure

One of the options below shall be selected.

- The file shall give space for 16 characters (17 byte, including initial format byte) (default)
- The file shall give space for characters (this generates extra development time and cost)

10.5.2 SPN Content

One of the options below shall be selected.

- Telenor CXN (default)
- The customer brand

10.5.3 SPN display

One of the options below shall be selected.

- SPN shall be replacing the network in the display (default)
- SPN shall be displayed together with the network

10.6 IMEI-Lock

This application locks the SIM to the first terminal it is installed in from the beginning. It stores the IMEI of the terminal, and will thereafter not give network access if installed in any other terminal.

One of the options below shall be selected.

The SIM shall be locked to the first IMEI used

- No (default)
- Yes (This is an application that can be provided at extra cost)

10.7 FPLMN Clearing

This application erases the contents of the FPLMN file at every startup

One of the options below shall be selected.

The SIM shall erase the FPLMN list during power-on

- Yes (**mandatory**)

10.8 LP (Language Preferences)

This is a list of language preferences, in priority order. The terminal shall use the first language in the list it has support for. For different generations of terminals, these settings are read from 3 different files in different directories of the SIM, EF_LP(Language Preferences)in the GSM directory, EF_LI (Language Indication) in the USIM directory and EF_PL(Preferred Languages)in the root directory. All files will be configured according to this priority list.

One of the options below shall be selected.

The language preferences shall be in the following order:

- Swedish, English (default)
- The following order: (Max 3 languages can be defined)

10.9 OTA

Customer requires the possibility to update content on SIM-card via OTA i.e. phonebook etc.

- Yes (**mandatory**)

10.10 Byte code

There's an application on some components, which can be used for executing scripts stored in a byte code file of the SIM. This can be used for creating a customised menu, with functions like getting input from the user, and sending pre-formatted short messages to a server. It can also get some information from the terminal, which can be included in the messages.

If not SMD, one of the options below shall be selected.

- No byte code is used (default, and only option for SMD)
- Default Telenor byte code is used
- The customer byte code is specified in appendix (this generates extra development time, and cost)

11. Parameter Text file

11.1 Description

It is possible to get information about parameters of each SIM card in character separated text files. The parameters will be separated by semi colon ";" and the file will be named [Order name].skv. (Other separator characters may be chosen). The file can be opened in notepad or any other text editor. It can also be imported to MS Excel. If importing it to Excel, make sure the fields are imported as text since ICCID is too long to be represented as an integer.

11.2 Structure

In case a parameter text file is wanted, the requested parameters shall be selected.

- ICCID (20 digits, starting with 894608 + prefix)
- IMSI (15 digits, starting with 24008)
- MSISDN (including the "+"-sign and country code)
- PIN1 (4 digits)
- PUK1 (8 digits)
- PIN2 (4 digits)
- PUK2 (8 digits)
- PARTNUMBER
- Other information as stated

Visual example with ICCID; IMSI;MSISDN;PIN1;PUK1

8946080003002500000X;240080000500000;+467190002500000;1111;12345678
8946080003002500104X;240080000500104;+467190002500104;1111;90123456

12. Packaging

One of the options below shall be selected.

- The cards shall be distributed in boxes of 500 cards (default)
- The cards shall be distributed in Telenor branded General Purpose Telematics envelopes; on General Purpose Telematics carriers (this generates extra cost)
- The cards shall be distributed on carriers in C5 envelopes. In appendix there is a separate design of the carriers (this generates extra cost).
- The SMD SIM modules shall be distributed on tape on reel.

13. List of appendix

In the event of specific customer requirement or input from the customer that do not fit in to this document, list the name and version of the appendixes associated with this customer SIM-specification document in the section below.

| Name of appendix | Related to chapter X in this SIM specification | Version and date | Author |
|------------------|--|------------------|--------|
| | | | |
| | | | |
| | | | |

14. References

- [1] GSM 03.19: "Subscriber Identity Module Application Programming Interface (SIM API); SIM API for Java Card; Stage 2" (v8.2.0 Release 1999)
- [2] GSM 03.48 "Security Mechanisms for the SIM application toolkit; stage 2" (v8.7.0 Release 1999)
- [3] GSM 11.11: " Specification of the Subscriber Identity Module – Mobile Equipment (SIM - ME) interface" (v8.5.0 Release 1999)
- [4] GSM 11.14: "Specification of the SIM Application Toolkit for the Subscriber Identity Module – Mobile Equipment (SIM - ME) interface" (v8.5.0 Release 1999)
- [5] SUN Java Card Specification "Java Card 2.1 API Specification"
- [6] SUN Java Card Specification "Java Card 2.1 Runtime Environment Specification"
- [7] SUN Java Card Specification "Java Card 2.1 VM Architecture Specification"
- [8] Open Platform Card Specification v2.0.1
- [9] 3G TS 31.101: "UICC-Terminal Interface; Physical and Logical Characteristics" (v3.3.0 Release 1999)
- [10] ETSI TS 102 221: "UICC-Terminal interface; Physical and logical characteristics " (v3.5.0 Release 1999)
- [11] 3G TS 31.102: "Characteristics of the USIM Application" (v3.7.0 Release 1999)
- [12] 3G TS 31.121: "USIM Application Test Specification" (v3.1.0 Release 1999)
- [13] 3G TS 31.122: "USIM Conformance Test Specification" (v3.1.0 Release 1999)
- [14] 3G TS 31.111: "USIM Application Toolkit (USAT)" (v3.6.0 Release 1999)
- [15] 3G TS 33.102: "3G Security; Security Architecture" (v3.10.0 Release 1999)
- [16] Telenor Connexion Preferred Roaming SIM List, Ver A9.
- [17] doc165B_VodaSe_v17
- [18] Strålfors SIM Artwork Guidelines
- [19] doc165B_TelenorSE_64k_USIM.pdf
- [20] StralforsSE_01.00TESE3G.xls