

# Layered HLR AUC Provisioning over MML

## Ericsson Dynamic Activation 1

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### INTERFACE DESCRIPTION

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# 1 Introduction

This section is an introduction to this document. It contains information about the prerequisites, purpose, scope, and target group for the document. This section also contains explanations of typographic conventions used in this document.

## 1.1 Purpose and Scope

This document describes the supported MML commands that can be used for provisioning of layered Authentication Center (AUC-FE) and layered Home Location Register (HLR-FE). The document also contains commands that have different characteristics internally in the Ericsson™ Dynamic Activation (EDA) system, individual and common data commands. Some of the commands are in the monolithic HLR considered as both individual and massive commands. This document lists only the individual commands. Additional Man-Machine Language (MML) commands, other than the ones mentioned in this document, are possible to add.

**Note:** This document is not intended to be used for M2M subscriptions.

## 1.2 Target Group

The target group for this document is as follows:

- System Integrator
- Network Administrator

## 1.3 Typographic Conventions

Typographic conventions are described in the document *Library Overview*, Reference [1].

In addition to the writing conventions mentioned above, the following applies:

- HLR-FE is referred to as HLR throughout this document.
- AUC-FE is referred to as AUC throughout this document.

For information about glossary and terms throughout this document, see *Glossary of Terms and Acronyms*, Reference [2].



## 1.4 Prerequisites

To use this document fully, users must meet the following prerequisites:

- Basic knowledge about the Dynamic Activation product
- For detailed descriptions about the parameters mentioned in this document, refer to **HLR specific documentation**.



## 2 Communication Protocol

The MML is a generic interface that has no dependencies between any data model and the data being sent and received.

The following are basic features of the MML:

- Synchronous operation; one command can be entered in one session.
- ASCII-character-based presentation

**Note:** Long client waiting times:

Depending on connection robustness configuration, the NE response time can result in long MML client waiting times. For more information, see *Function Specification Resource Activation*, Reference [7].

For some commands, a massive search is requested from CUDB and therefore the interface that is synchronized is waiting for the response to be processed. This can result in long MML client waiting times.

The following standards can be used as transport and network layers:

- Direct Socket (Raw Socket)
- TELNET
- SSH

### 2.1 Direct Socket

The Direct Socket interface is a raw TCP socket over IP. It is a connection-oriented protocol providing a reliable, full-duplex byte stream for a user process. TCP takes care of communication details such as acknowledgments, timers, and retransmissions.

### 2.2 TELNET

Standard telnet procedures are used to open a connection. Each end is assumed to act as a network virtual terminal. The client is always the initiating side and option negotiation can take place within the structure of the TELNET Protocol, see <http://www.faqs.org/rfcs/rfc854.html>, Reference [10]. Any side can choose to clear the connection.

The MML interface supports only the telnet options `Suppress GO Ahead` and `Echo`.



- Negotiating telnet options:

- Suppress GO Ahead

When this option is in effect on the connection, then both parties can send data at the same time, without any Go Ahead message from the opposite party.

This command is enabled by default. Inbound telnet requests the client to use this command.

- Echo

Sent by the client or server for the use of telnet echo. The echo party transmit back the data characters it receives to the other party. It is normally used by clients to not show entered passwords in clear text on the screen. The echo party replaces the password characters instead in the echoing with stars “\*” that is printed on the client side.

This command is disabled by default but can be initiated by the client.

## 2.3 SSH

Secure Shell (SSH) is a cryptographic network protocol for secure data communication between two networked computers that connects, through a secure channel over an insecure network, a server and a client running SSH server and SSH client programs, respectively.

The client is always the initiating side and option negotiation can take place within the structure of the SSH Protocol. Any side can choose to clear the connection.

For more information, see <http://www.ietf.org/rfc/rfc4251.txt>, Reference [11].

## 2.4 Ports

The default port for the MML interface is 8010 for TELNET, and 8111 for SSH.

## 2.5 Login Procedure

The login procedure for TELNET is as follows:

```
USERCODE: <username>
PASSWORD: <password>
DOMAIN: <CR>
MA MML PAGE 1
<
```





The login procedure for SSH is as follows:

```
login as: <username>
<username>@localhost's password:<password>
MA MML PAGE 1
<
```

### 2.5.1 Login Errors

This section contains information about the errors that can occur in a login attempt:

Error Message	Description
NOT ACCEPTED	Invalid username or password supplied
AUTHORIZATION FAILURE NOT ACCEPTED	User has exceeded the maximum number of allowed connections.
MAX ALLOWED CONNECTIONS ALREADY OPENED	

## 2.6 Logout Procedure

The logout procedure is as follows:

```
< EXIT;

LOGGED OFF
<Connection closed by foreign host.
CL24-PL-3:~ #
```

## 2.7 Session and Presentation Layer

The session and presentation layers are proprietary Ericsson and support two types of messages:

- Control messages
- Data messages (CSO)

A message is coded using standard 8-bit ASCII characters.

A number of concurrent sessions can be established on the port on every processing node. The maximum number of connections allowed can be configured by system administrators. For further information on how to use concurrent sessions, see *System Administrators Guide for Native*



*Deployment, Reference [3], or System Administrators Guide for Virtual and Cloud Deployment, Reference [4].*

Each session is independent of any previous opened sessions. Interference between two sessions must be handled by the BSS. Dynamic Activation does not guarantee a mutual exclusion, for example, if two sessions are concurrently operating on the same subscriber identity, one of the sessions may or may not receive an error code back.

## 2.8 Queued Printouts

Printouts of commands that respond with `RESULT PRINTOUT` are queued and the terminal must be released for the printout to be printed.

To release the terminal and receive queued printouts, press **CTRL-D** (EOT).

For `ORDERED` commands, it is possible to receive `NOT ACCEPTED FORMAT ERROR`, either directly (without `ORDERED`) or after `ORDERED` is returned.

**Note:** The terminal is released and queued printouts are printed. No new commands are accepted when a queued printout is pending.

After the printout, press **ENTER** (NL) to receive a prompt, and resume with the command input.

The following commands can respond with `RESULT PRINTOUT`:

**Note:** They all have `ORDERED` in the Procedure Printout. As an example, see Section 4.1.1.2.2 on page 12.

- AGAAC
- AGSUC
- HGAPE
- HGAPP\*
- HGLDP
- HGMSP
- HGPDP
- HGSGP
- HGPSP\*



**Note:** Commands with \* do not return ORDERED by default. Users can change the default behavior by editing the file `mml.properties`. For example, by adding `HGAPP_EOT=true` at the designated EOT section in `mml.properties`.

For detailed instructions, refer to *System Administrators Guide for Native Deployment*, Reference [3], or *System Administrators Guide for Virtual and Cloud Deployment*, Reference [4].





## 3 MML Command Syntax

This section contains some general information about the MML commands.

### 3.1 Command Syntax

This section describes the syntax for the MML commands.

Each command is represented by a short name (five letters). For example, `Set Subscriber Data` has the short name `HGSDC`. The short name is always the one written in the command prompt. The following is an example of the command `HGSDC`:

```
>HGSDC:MSISDN=123456789012345,SUD=CFU-2;
```

#### 3.1.1 Delimiters

The following table contains delimiters for the MML commands.

*Table 1 Delimiters*

Delimiter	Description
:	Separates the command name from its parameters.
=	To the left of this symbol is a parameter name. To the right of this symbol is the parameter value.
&	Separates two different values for the same parameter.
&&	Separates the start value and end value in a value range. Start and end values must have the same number of digits.
;	Finishes the command.
,	Separates parameters.
"	Text String delimiter.

#### 3.1.2 Command Descriptions

**Note:** The Command Descriptions throughout this document apply for the layered solution. Any deviations from the classic MML commands are shown for each command in their respective subsection.

The following is an example of the `Set Subscriber Data Command Description`.


$$\text{HGSDC:MSISDN=msisdn,} + \left[ \begin{array}{l} \text{SUD=sud} \\ \text{PROFILE=profile} \end{array} \right] + ;$$

**Note:** There is no need to enter the parameters in the order they appear in the Command Description.

Table 2 explains how the Command Description is built.

*Table 2 Syntaxes in Command Descriptions*

Syntax	Description
[A]	A is optional.
$\left[ \begin{array}{c} A \\ B \end{array} \right]$	A and B are optional, but they cannot be used together.
$\left[ \begin{array}{c} A \\ + \quad + \\ B \end{array} \right]$	Use either A or B (choice).
A=a...	The parameter supports the use of "&" or "&&", for multiple values. It is, however, never required to enter multiple values.  For example: A=a&b&c&d, where A contains the values a, b, c, and d. or A=a&&b, where A contains the values in the numeric range between a and b. Note that a and b must be numeric values with same number of digits.
A=a	Only one value (a) is allowed.

**Note:** The Command Description syntaxes can be nested inside each other.



## 4 MML AUC Commands

This section covers the supported individual MML AUC commands. Each subchapter contains the Command Description and parameter information for the specific command.

For information about the different fault types and error codes, see Section 7 on page 175.

**Note:** If not explicitly stated otherwise, `Check Printout` does not apply.

### 4.1 AGAA: Authentication and Key Agreement Algorithm

This section covers the following MML AUC commands:

- Authentication Center, Authentication and Key Agreement Algorithm, Change (AGAAC) (Section 4.1.1 on page 11)
- Authentication Center, Authentication and Key Agreement Algorithm, Print (GAAP) (Section 4.1.2 on page 13)

#### 4.1.1 Authentication Center, Authentication and Key Agreement Algorithm, Change (AGAAC)

This command changes the AKA Algorithm indicator for those WCDMA subscribers whose Function Set (FSET) supports the two algorithm framework feature in Authentication Center (AUC). FSET supporting the two algorithm framework feature is determined by an AXE parameter.

Deviations:

- AKAALGIND does not support value `DEFAULT`.
- The AGAAC command does not support the `CONTINUE` parameter.
- Only the individual subscriber version of the command is supported.

##### 4.1.1.1 AGAAC Command Description

```
AGACC:IMSI=imsi,AKAALGIND=akaalgind;
```

##### Example of an AGAAC Command

```
AGAAC:IMSI=123456789012345,AKAALGIND=1;
```

The Authentication and Key Agreement (AKA) algorithm indicator of the subscribed Wideband Code Division Multiple Access (WCDMA) International



Mobile Subscriber Identity (IMSI) number 123456789012345 and associated FSET supporting two algorithm framework feature is changed to AKA algorithm 1.

#### 4.1.1.1.1 AGAAC Subscription Parameters

The following table explains the parameters for the AGAAC Subscription command.

*Table 3 AGAAC Subscription Parameters*

Parameter	Type	Description
imsis	Digit string 6-15 digits Each digit is 0-9 characters	The International Mobile Subscriber Identity of the subscriber
akaalgind	One of the following text strings: <ul style="list-style-type: none"><li>• 1</li><li>• 2</li></ul>	Authentication and Key Agreement (AKA) Algorithm indicator

#### 4.1.1.2 AGAAC Printout

This section list all AGAAC printouts.

##### 4.1.1.2.1 Check Printout

Yes.

##### 4.1.1.2.2 Procedure Printout

```
[ ORDERED  
+ NOT ACCEPTED  
fault type ]
```

##### 4.1.1.2.3 Answer Printout

This command has no answer printouts.

##### 4.1.1.2.4 Result Printout

Result printout is supported.





```
AUC AKA ALGORITHM CHANGE RESULT
```

```

EXECUTED
[*** NOT LOGGED FOR BACKUP]
+
NOT EXECUTED
fault type
+

```

```
END
```

This printout has no parameters.

- EXECUTED - The command has been executed.
- NOT EXECUTED - The command has not been executed.

## 4.1.2 Authentication Center, Authentication and Key Agreement Algorithm, Print (AGAAP)

This command prints subscription and Authentication and Key Agreement (AKA) Algorithm data for UMTS mobile subscribers in the AUC.

Deviations:

- Only the individual subscriber version of the command is supported.

### 4.1.2.1 AGAAP Command Description

```
AGAAP:IMSI=imsi;
```

#### Example of an AGAAP Command

```
AGAAP:IMSI=123456789012345;
```

The subscription and AKA Algorithm data for subscribed UMTS IMSI numbers 123456789012345 are printed.

#### 4.1.2.1.1 AGAAP Subscription Parameters

The following table explains the parameters for the AGAAP Subscription command.

*Table 4 AGAAP Subscription Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits Each digit is 0-9.	The International Mobile Subscriber Identity of the subscriber



#### 4.1.2.2 AGAAP Printout

This section lists all AGAAP printouts.

##### 4.1.2.2.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

##### 4.1.2.2.2 Answer Printout

The AKAALGIND parameter cannot have value N/A or DEFAULT in User Data Consolidation (UDC).

```
AUC AKA ALGORITHM SUBSCRIPTION DATA

IMSI
EKI                                KIND  FSETIND  A4IND  AKAALGIND
AMF
imsi
eki                                kind  fsetind  a4ind  akaalgind
amf

[NONE]

END
```

The following table contains information about the parameters in the answer printout:

*Table 5 AGAAP Answer Printout Parameters*

Parameter	Type	Description
imsis	Digit string 6-15 digits Each digit is 0-9 characters	The International Mobile Subscriber Identity of the subscriber
eki	Hexadecimal digit string 32 digits	Encrypted Subscriber Authentication key
kind	unsignedShort Value 0-511	The index of the key to be used in association with the DEFA 1 version of the algorithm A <sub>d</sub>
fsetind	unsignedByte Value 0-31	Function set indicator
a4ind	unsignedByte 0-7	A4 algorithm indicator



Parameter	Type	Description
akaaalgind	One of the following values: <ul style="list-style-type: none"> <li>• 1</li> <li>• 2</li> <li>• N/A</li> </ul>	Authentication and Key Agreement (AKA) Algorithm indicator
amf	Digit String Value 0-65,535	Authentication Management Field

#### 4.1.2.2.3 Result Printout

This command has no result printouts.

## 4.2 AGSU: Subscription

This section covers the following MML AUC commands:

- Authentication Center, Subscription, Initiate (AGSUI) (Section 4.2.1 on page 15)
- Authentication Center, Subscription, Change (AGSUC) (Section 4.2.2 on page 16)
- Authentication Center, Subscription, End (AGSUE) (Section 4.2.3 on page 18)
- Authentication Center, Subscription, Print (AGSUP) (Section 4.2.4 on page 19)

### 4.2.1 Authentication Center, Subscription, Initiate (AGSUI)

This command initiates the subscription of a mobile subscriber in the AUC.

#### 4.2.1.1 AGSUI Command Description

$$\text{AGSUI:IMSI=imsi,EKI=eki,KIND=kind} \left[ \begin{array}{c} \left[ \begin{array}{c} \text{A3A8IND=a3a8ind} \\ \text{FSETIND=fsetind} \end{array} \right] \\ + \\ \left[ \begin{array}{c} \text{A4IND=a4ind} \\ \text{ZONEID=zoneid} \\ \text{RID=rid} \end{array} \right] \end{array} \right]$$

#### Example of an AGSUI Command

```
AGSUI:IMSI=123456789012345,KIND=23,A3A8IND=1,A4IND=2,
      EKI=1234567890ABCDEF1234567890ABCDEF;
```



The subscription of a mobile subscriber with IMSI 123456789012345, EKI 1234567890ABCDEF1234567890ABCDEF, KIND 23, A3A8IND 1, A4IND 2 is initiated. The GSM AKA type is used.

#### 4.2.1.1.1 AGSUI Subscription Parameters

The following table explains the parameters for the AGSUI Subscription command.

*Table 6 AGSUI Subscription Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits	The International Mobile Subscriber Identity of the subscriber
eki	Hexadecimal digit string 32 digits	Encrypted Subscriber Authentication key
kind	unsignedShort Value 0-511	The index of the key to be used in association with the <code>DEA_1</code> version of the algorithm <code>A<sub>d</sub></code>
a3a8ind	unsignedByte Value 0-15	A3/A8 algorithm indicator
fsetind	unsignedByte Value 0-31	Function set indicator
a4ind	unsignedByte 0-7	A4 algorithm indicator
rid	Integer 0-31	Region ID for the multi-region support
zoneid	Integer 0-65535	This parameter indicates the geographical area to which the MultiSC or the association belongs.

#### 4.2.1.2 AGSUI Printouts

This section list all AGSUI printouts.

##### 4.2.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 4.2.1.2.2 Answer Printout

This command has no answer printouts.

##### 4.2.1.2.3 Result Printout

This command has no result printouts.



## 4.2.2 Authentication Center, Subscription, Change (AGSUC)

This command changes subscriber data in the AUC.

Deviations:

- The AGSUC command does not support the CONTINUE parameter.
- Only the individual subscriber version of the command is supported

### 4.2.2.1 AGSUC Command Description

```
AGSUC:IMSI=imsi,AMF=amf,FSETIND=fsetind;
```

#### Example of an AGSUC Command

```
AGSUC:IMSI=123456789012345,AMF=14532,FSETIND=2;
```

The Authentication Management Field (AMF) of the subscribed WCDMA IMSI numbers 123456789012345 and FSETIND 2 is changed to 14532.

#### 4.2.2.1.1 AGSUC Subscription Parameters

The following table explains the parameters for the AGSUC Subscription command.

*Table 7 AGSUC Subscription Parameters*

Parameter	Type	Description
amf	Digit String Value 0-65535	Authentication Management Field
fsetind	unsignedByte Value 0-31	Function set indicator
imsi	Digit string 6-15 digits Each digit is 0-9 characters	The International Mobile Subscriber Identity of the subscriber

### 4.2.2.2 AGSUC Printouts

This section list all AGSUC printouts.



#### 4.2.2.2.1 Procedure Printout

```
[ORDERED
+NOT ACCEPTED
+fault type
]
```

#### 4.2.2.2.2 Answer Printout

This command has no answer printouts.

#### 4.2.2.2.3 Result Printout

Result printout is supported.

AUC SUBSCRIPTION DATA CHANGE RESULT

```
[EXECUTED
+*** NOT LOGGED FOR BACKUP]
+NOT EXECUTED
+fault type
]
```

END

This printout has no parameters.

- EXECUTED - The command has been executed.
- NOT EXECUTED - The command has not been executed.

### 4.2.3 Authentication Center, Subscription, End (AGSUE)

This command ends the subscription of a mobile subscriber in the AUC.

This command is always capable of removing an AUC subscription, even if a previous AGSUI or AGSUE has failed.

#### 4.2.3.1 AGSUE Command Description

AGSUE:IMSI=imsi;

##### Example of an AGSUE Command

AGSUE:IMSI=123456789012345;

The subscription of mobile subscriber with IMSI 123456789012345 is ended.



#### 4.2.3.1.1 AGSUE Subscription Parameters

The following table explains the parameters for the AGSUE Subscription command.

*Table 8 AGSUE Subscription Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits Each digit is 0-9 characters	International Mobile Subscriber Identity

#### 4.2.3.2 AGSUE Printout

This section list all AGSUE printouts.

##### 4.2.3.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 4.2.3.2.2 Answer Printout

This command has no answer printouts.

##### 4.2.3.2.3 Result Printout

This command has no result printouts.

#### 4.2.4 Authentication Center, Subscription, Print (AGSUP)

This command prints subscription data of mobile subscribers in the AUC.

Deviations:

- Only the individual subscriber version of the command is supported
- The parameter AKATYPE is not supported.

##### 4.2.4.1 AGSUP Command Description

```
AGSUP:IMSI=imsi;
```

##### Example of an AGSUP Command



```
AGSUP:IMSI=123456789012345;
```

The subscription data for subscribed IMSI numbers 123456789012345 are printed.

#### 4.2.4.1.1 AGSUP Subscription Parameters

The following table explains the parameters for the AGSUP Subscription command.

*Table 9 AGSUP Subscription Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits Each digit is 0-9 characters	International Mobile Subscriber Identity of the subscriber

#### 4.2.4.2 AGSUP Printout

This section list all AGSUP printouts.

##### 4.2.4.2.1 Procedure Printout

```
NOT ACCEPTED  
fault type
```

##### 4.2.4.2.2 Answer Printout

```
AUC SUBSCRIPTION DATA
```

```
AKATYPE [ZONEID] [RID]  
akatype [zoneid] [rid]
```

```
IMSI EKI
```

$$\text{KIND} \left[ \begin{array}{c} \text{A3A8IND} \\ \text{FSETIND} \end{array} \right] \text{A4IND}$$
$$\left[ \text{AMF} \right]$$

```
imsi eki
```

$$\text{kind} \left[ \begin{array}{c} \text{a3a8ind} \\ \text{fsetind} \end{array} \right] \text{a4ind}$$
$$\left[ \text{amf} \right]$$

```
[NONE]
```

```
END
```

The following table contains information about the parameters in the answer printout





**Table 10 AGSUP Answer Printout Parameters**

Parameter	Type	Description
akatype	Integer 0-1 0 = GSM 1 = WCDMA	Authentication and Key Agreement (AKA) type Default value is: <ul style="list-style-type: none"> <li>• 0 if only GSM AKA type is supported by the exchange</li> <li>• 1 if only WCDMA AKA type supported by the exchange.</li> <li>• Determined by an AXE parameter if both GSM and WCDMA AKA types are supported by the exchange.</li> </ul>
imsi	Digit string 6-15 digits	International Mobile Subscriber Identity
eki	Hexadecimal digit string 32 digits	Encrypted Subscriber Authentication key
kind	unsignedShort Value 0-511	The index of the key to be used in association with the <code>DEA_1</code> version of the algorithm <code>A4</code>
a3a8ind	unsignedByte Value 0-15	A3/A8 algorithm indicator
fsetind	unsignedByte Value 0-31	Function set indicator
amf	Digit String Value 0-65535	Authentication Management Field
a4ind	unsignedByte 0-7	A4 algorithm indicator
rid	Integer 0-31	Region ID for the multi-region support
zoneid	Integer 0-65535	This parameter indicates the geographical area to which the MultiSC or the association belongs.

#### 4.2.4.2.3 Result Printout

This command has no result printouts.





## 5 MML HLR Commands

This section covers the supported individual MML HLR commands. Each subchapter contains the Command Description parameter information for the specific command.

For information about the different fault types and error codes, see Section 7 on page 175.

**Note:** If not explicitly stated otherwise, `Check Printout` does not apply.

### 5.1 HGAP: Access Point Name

This section covers the following MML HLR commands:

- Home Location Register, Access Point Name, Initiate (HGAPI) (Section 5.1.1 on page 23)
- Home Location Register, Access Point Name, Change (HGAPC) (Section 5.1.2 on page 25)
- Home Location Register, Access Point Name, End (HGAPE) (Section 5.1.3 on page 26)
- Home Location Register, Access Point Name, Print (HGAPP) (Section 5.1.4 on page 28)

#### 5.1.1 Home Location Register, Access Point Name, Initiate (HGAPI)

This command initiates an APN in the HLR.

The entered APN must be compliant with the following syntax:

- The length of the APN cannot exceed 62 characters
- The APN consists of one or more labels separated by dots. Each label must start with a letter or a digit, end with a letter or a digit, and have as criteria characters only letters, digits, and hyphen
- APN must not start with the text RAC, LAC, SGSN, or RNC
- APN must not end in .GPRS

If the parameter APNID is entered, the APN identifier associated to the entered APN is chosen by the operator. If not an identifier is internally assigned.

Deviations:



- Monolithic HLR enforces the client to divide the APN in APN1 and APN2 if APN is longer than 41 characters. This is not the case in the Dynamic Activation interface. APN2 is only supported for backward compatible reason
- The parameter APNID is mandatory in UDC

### 5.1.1.1 HGAPI Command Description

```
HGAPI:APN1=apn1[,APN2=apn2],APNID=apnid[,HLRFEID=hlrfeid];
```

#### Example of an HGAPI Command

```
HGAPI:APN1="COM",APN2="PANY.COM",APNID=155,HLRFEID="FT_HLR";
```

The APN COMPANY.COM with APNID 155 is initiated on HLR Front End with Id FT\_HLR.

#### 5.1.1.1.1 HGAPI Parameters

The following table contains the parameters for the HGAPI command.

*Table 11 HGAPI Parameters*

Parameter	Type	Description
apn1	Text string 1-62 characters	Access Point Name (APN) first part
apn2	Text string 1-62 characters	APN second part
apnid	Integer 0-16,383	APN identifier
hlrfeid	Text string	The hlrfeid where to send the command.  Normally, the hlrfeid is omitted, which means the order is executed in all HLR Front Ends.

### 5.1.1.2 HGAPI Printout

This section lists all HGAPI printouts.

#### 5.1.1.2.1 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED  
fault type
```

#### 5.1.1.2.2 Answer Printout

This command has no answer printouts.



#### 5.1.1.2.3 Result Printout

This command has no result printouts.

### 5.1.2 Home Location Register, Access Point Name, Change (HGAPC)

This command changes the APN associated to an APN identifier defined in the HLR.

The entered APN must be compliant with the following syntax:

- The length of the APN cannot exceed 62 characters
- The APN consists of one or more labels separated by dots. Each label must start with a letter or a digit, end with a letter or a digit, and have as criteria characters only letters, digits, and hyphen
- APN must not start with the text RAC, LAC, SGSN, or RNC
- APN must not end in .GPRS

Deviations:

- Monolithic HLR enforces the client to divide the APN in APN1 and APN2 if APN is longer than 41 characters. This is not the case in the Dynamic Activation interface. APN2 is only supported for backward compatible reason

#### 5.1.2.1 HGAPC Command Description

```
HGAPC:APNID=apnid,APN1=apn1[,APN2=apn2][,HLRFEID=hlrfeid];
```

##### Example of an HGAPC Command

```
HGAPC:APNID=16000,APN1="COMMUNICATIONCENTER.2RDDEPARTMENT.",
APN2="MADRID.ES";
```

The APN COMMUNICATIONCENTER.2RDDEPARTMENT.MADRID.ES is associated to APNID 16000.

#### 5.1.2.1.1 HGAPC Parameters

The following table contains the parameters for the HGAPC command.

*Table 12 HGAPC Parameters*

Parameter	Type	Description
apn1	Text string 1-62 characters	Access Point Name (APN) first part
apn2	Text string 1-62 characters	APN second part



Parameter	Type	Description
apnid	Integer 0-16,383	APN identifier
hlrfeid	Text string	The <code>hlrfeid</code> where to send the command. Normally, the <code>hlrfeid</code> is omitted, which means the order is executed in all HLR Front Ends.

### 5.1.2.2 HGAPC Printout

This section lists all HGAPC printouts.

#### 5.1.2.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.1.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.1.2.2.3 Result Printout

This command has no result printouts.

### 5.1.3 Home Location Register, Access Point Name, End (HGAPE)

This command deletes an APN in the Home Location Register (HLR).

The entered APN must be compliant with the following syntax:

- The length of the APN cannot exceed 62 characters
- The APN consists of one or more labels separated by dots. Each label must start with a letter or a digit, end with a letter or a digit, and have as criteria characters only letters, digits, and hyphen
- APN must not start with the text RAC, LAC, SGSN, or RNC
- APN must not end in .GPRS

An APN can also be deleted by its corresponding APN identifier if parameter APNID is entered.

Deviations:

- Monolithic HLR enforces the client to divide the APN in APN1 and APN2 if APN is longer than 41 characters. This is not the case in the Dynamic



Activation interface. APN2 is only supported for backward compatible reason

### 5.1.3.1 HGAPE Command Description

$$\text{HGAPE:} \left[ \begin{array}{l} \text{APN1=apn1 [, APN2=apn2]} \\ \text{APNID=apnid} \end{array} \right] \left[ \text{, HLRFEID=hlrfeid} \right];$$

#### Example of an HGAPE Command

```
HGAPE:APN1="1COMMUNICATIONCENTER.RDDEPARTMENT.MADRID.",
APN2="ES",HLRFEID="FT_HLR";
```

The APN 1COMMUNICATIONCENTER.RDDEPARTMENT.MADRID.ES on HLR Front End with Id FT\_HLR is deleted.

#### 5.1.3.1.1 HGAPE Parameters

The following table contains the parameters for the HGAPE command.

*Table 13 HGAPE Parameters*

Parameter	Type	Description
apn1	Text string 1-62 characters	Access Point Name (APN) first part
apn2	Text string 1-62 characters	APN second part
apnid	Integer 0-16,383	APN identifier
hlrfeid	Text string	The hlrfeid where to send the command. Normally, the hlrfeid is omitted, which means the order is executed in all HLR Front Ends.

### 5.1.3.2 HGAPE Printout

This section lists all HGAPE printouts.

#### 5.1.3.2.1 Procedure Printout

$$\left[ \begin{array}{l} \text{ORDERED} \\ \text{NOT ACCEPTED} \\ \text{fault type} \end{array} \right]$$



#### 5.1.3.2.2 Answer Printout

This command has no answer printouts.

#### 5.1.3.2.3 Result Printout

```
HLR ACCESS POINT NAME END RESULT
```

```
[ EXECUTED ]
+          +
[ NOT EXECUTED ]
[ fault type ]

END
```

This printout has no parameters.

- EXECUTED - The command has been executed.
- NOT EXECUTED - The command has not been executed.

### 5.1.4 Home Location Register, Access Point Name, Print (HGAPP)

This command prints APN data in the HLR.

Answer printout HLR ACCESS POINT NAME DATA is received.

If parameter APN1 and, if necessary, APN2 are entered, the APN and the corresponding APN identifier are printed.

The entered APN must be compliant with the following syntax:

- The length of the APN cannot exceed 62 characters
- The APN consists of one or more labels separated by dots. Each label must start with a letter or a digit, end with a letter or a digit, and have as criteria characters only letters, digits, and hyphen
- APN must not start with the text RAC, LAC, SGSN, or RNC
- APN must not end in .GPRS

If parameter APNID is entered, the APN identifier and the corresponding APN are printed.

If parameter APNID or APN1 and, if necessary, APN2 are entered, the Mobile Subscriber ISDN Number (MSISDN) and the IMSI of the mobile subscribers that use the entered APN in any of their Packet Data Protocol (PDP) contexts, either directly assigned to the subscriber or through a PDP context profile, are printed. In case, the PDP context is assigned to the subscriber through a PDP context profile, the PDP context profile is printed. For those PDP contexts





directly assigned to the subscriber, the corresponding PDP context identifiers are printed.

If parameter `APNID` or `APN1` and, if necessary, `APN2` are entered, the PDP context profiles that use the entered `APN` in any of their defined PDP contexts and the corresponding PDP context identifiers are printed.

In case the PDP context is assigned to the subscriber through a PDP context profile, the PDP context profile is printed.

For those PDP contexts directly assigned to the subscriber, the corresponding PDP context identifiers are printed.

Deviations:

- Monolithic HLR enforces the client to divide the `APN` in `APN1` and `APN2` if `APN` is longer than 41 characters. This is not the case in the Dynamic Activation interface. `APN2` is only supported for backward compatible reason
- Parameters `MSUSERS` and `PDPCPS` are not supported.

#### 5.1.4.1

#### HGAPP Command Description

$$\text{HGAPP:} \left[ \begin{array}{l} \text{APN1=apn1} [, \text{APN2=apn2}] \\ \text{APNID=apnid} \end{array} \right] \left[ \begin{array}{l} \\ \end{array} \right] [, \text{HLRFEID=hlrfeid}] ;$$

#### Example of an HGAPP Command

```
HGAPP:APN1="COMPANY.COM",HLRFEID="FT_HLR";
```

The `APN COMPANY.COM` and the corresponding `APNID` on HLR Front End with `Id FT_HLR` are printed.

#### 5.1.4.1.1

#### HGAPP Parameters

The following table contains the parameters for the HGAPP command.

*Table 14 HGAPP Parameters*

Parameter	Type	Description
apn1	Text string 1-62 characters	Access Point Name (APN) first part
apn2	Text string 1-62 characters	APN second part



Parameter	Type	Description
apnid	Integer 0-16,383 String ALL = Return all registered APNs.	APN identifier
hlrfeid	Text string	The hlrfeid where to send the command. Normally, the hlrfeid is omitted, which means the order is executed in all HLR Front Ends.

#### 5.1.4.2 HGAPP Printout

This section lists all HGAPP printouts.

##### 5.1.4.2.1 Procedure Printout

```
[
ORDERED
+
NOT ACCEPTED
fault type
+
]
```

##### 5.1.4.2.2 Answer Printout

#### HLR ACCESS POINT NAME DATA

HLR ACCESS POINT NAME DATA

APN	APNID
apn	apnid

[NONE]

END

The following table contains information about the parameters in the HGAPP answer printout:



**Table 15** *HGAPP Answer Printout Parameters*

Parameter	Type	Description
apn	String, 1-62 characters  The entered APN must be compliant with the following syntax:  <ul style="list-style-type: none"> <li>The APN consists of one or more labels separated with dots. Each label must start with a letter or a digit, end with a letter or a digit, and have as criteria characters only letters, digits, and hyphens.</li> <li>APN must not start with the text RAC, LAC, SGSN, or RNC</li> <li>APN must not end in .GPRS.</li> </ul>	Access Point Name (APN)  The APN is the name of an access point for Serving General Packet Radio Service (GPRS). It represents a network to which a mobile phone can be connected.
apnid	Integer 0-16,383	APN identifier

#### 5.1.4.2.3 Result Printout

Same as for Answer printout, see HLR ACCESS POINT NAME DATA.

## 5.2 HGAM: Additional MSISDN

This section covers the following MML HLR commands:

- Home Location Register, Additional MSISDN, Initiate (HGAMI) (Section 5.2.1 on page 31)
- Home Location Register, Additional MSISDN, End (HGAME) (Section 5.2.2 on page 32)

### 5.2.1 Home Location Register, Additional MSISDN, Initiate (HGAMI)

This command initiates the subscription of an additional MSISDN, which is tied to a specified Public Land Mobile Network (PLMN) Bearer Capability (BC) number, for a Mobile Subscriber (MS).

#### 5.2.1.1 HGAMI Command Description

`HGAMI:MSISDN=msisdn,AMISDN=amsisdn,BC=bc;`

#### Example of an HGAMI Command

`HGAMI:MSISDN=345678901234567,AMISDN=591900005020,BC=65534;`



In the example above, the additional MSISDN 591900005020 is tied to the PLMN BC number 65534 and the MSISDN for the MS is 345678901234567. This command initiates the subscription of this additional MSISDN for the MS.

#### 5.2.1.1.1 HGAMI Parameters

The following table lists the parameters for the HGAMI command.

*Table 16 HGAMI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
amsisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Additional MSISDN
bc	Integer, value range: 0, 1, 10–65,535	PLMN BC number

#### 5.2.1.2 HGAMI Printout

This section lists all HGAMI printouts.

##### 5.2.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 5.2.1.2.2 Answer Printout

This command has no answer printouts.

##### 5.2.1.2.3 Result Printout

This command has no result printouts.

#### 5.2.2 Home Location Register, Additional MSISDN, End (HGAME)

This command ends the subscription of an additional MSISDN for a Mobile Subscriber (MS).

This command is always capable of removing an Additional MSISDN, even if a previous HGAMI or HGAME has failed.

##### 5.2.2.1 HGAME Command Description

```
HGAME:AMSIIDN=amsisdn;
```



### Example of an HGAME Command

```
HGAME:AMSIDN=591900005020;
```

In the example above, the subscription of the additional MSISDN 591900005020 is ended.

#### 5.2.2.1.1 HGAME Parameter

The following table lists the parameter for the HGAME command.

*Table 17 HGAME Parameter*

Parameter	Type	Description
amsisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Additional MSISDN

#### 5.2.2.2 HGAME Printout

This section lists all HGAME printouts.

##### 5.2.2.2.1 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED
fault type
```

##### 5.2.2.2.2 Answer Printout

This command has no answer printouts.

##### 5.2.2.2.3 Result Printout

This command has no result printouts.

### 5.3 HGCM: CAMEL Subscription Data

This section covers the following MML HLR commands:

- Home Location Register, CAMEL Subscription Data, Initiate (HGCMi) (Section 5.3.1 on page 34)
- Home Location Register, CAMEL Subscription Data, Initiate (HGCMC) (Section 5.3.2 on page 38)
- Home Location Register, CAMEL Subscription Data, Initiate (HGCMC) (Section 5.3.3 on page 41)

- Home Location Register, CAMEL Subscription Data, Initiate (HGCMPI)  
(Section 5.3.4 on page 45)

### 5.3.1 Home Location Register, CAMEL Subscription Data, Initiate (HGCMPI)

This command initiates CAMEL subscription data for a mobile subscriber or for a CAMEL subscription profile.

The parameter `CCH` is used to indicate which CAMEL phase the subscription data is valid for.

When the parameter `MMTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `MMTDP` is used the CAMEL subscription data is applicable in mobility management event notifications to the GSM service control function.

When the first `MMTDP` is initiated, parameters `SK` and `GSA` are mandatory. For the following `MMTDPs`, parameters `SK` and `GSA` can be omitted or given with the same values as the first `MMTDP`.

It is possible to define up to ten mobility management CAMEL phase 3 subscription data for a subscriber or for a CAMEL subscription profile.

When the parameter `DSTDP` and `DIALNUM` have been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameters `DSTDP` and `DIALNUM` are used, the CAMEL subscription data is applicable for mobile originating and forwarded calls. The `DIALNUM` indicates if GSM service control function shall be contacted or not to trigger a dialled service for the call.

It is possible to define up to ten dialled service CAMEL phase 3 subscription data for a subscriber or for a CAMEL subscription profile.

When the parameter `TSMSTDP` has been given in the command, only `CCH` parameter value 4 is accepted. If the parameter `CCH` is not present, value 4 is assigned by default.

If the parameter `TSMSTDP` is used the CAMEL subscription data is applicable in mobile terminating SMS.

It is possible to define up to 10 terminating SMS CAMEL phase 4 subscription data for a subscriber or for a CAMEL subscription profile.

When the parameter `OSMSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.



If the parameter `OSMSTDP` is used the CAMEL subscription data is applicable in mobile originating SMS.

It is possible to define up to 10 originating SMS CAMEL phase 3 subscription data for a subscriber or for a CAMEL subscription profile.

When the parameter `GPRSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `GPRSTDP` is used the CAMEL subscription data is applicable in the GPRS network.

It is possible to define up to ten GPRS CAMEL phase 3 subscription data for a subscriber or for a CAMEL subscription profile.

When the parameter `OCTDP` has been given in the command with the value 4, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in this case value 3 is assigned by default. For other value of parameter `OCTDP`, `CCH` parameter values 1, 2, 3 or 4, are accepted. If parameter `CCH` is not present in this case, value 1 is assigned by default.

If the parameter `OCTDP` is used the CAMEL subscription data is applicable for mobile originating and forwarded calls.

It is possible to define up to ten originating CAMEL subscription data per CAMEL phase for a subscriber or for a CAMEL subscription profile.

When the parameter `TCTDP` has been given in the command with the value 13 or 14, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in these cases values 3 is assigned by default. For other value of parameter `TCTDP`, `CCH` parameter values 1, 2, 3 or 4, are accepted. If parameter `CCH` is not present in this case, value 1 is assigned by default.

If parameter `TCTDP` is used the CAMEL subscription data is applicable for mobile terminating calls. The parameter `I` give the possibility to restrict the sending of terminating CAMEL subscription data for the given terminating CAMEL TDP to `GMSC` when the subscriber is roaming inside `HPLMN`.

If the parameter `I` is not present, default value `N` is assigned.

It is possible to define up to ten terminating CAMEL subscription data per CAMEL phase for a subscriber or for a CAMEL subscription profile.

When the parameter `VTDP` has been given in the command, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `VTDP` is used the CAMEL subscription data is applicable for mobile terminating calls in the `VMSC`.



It is possible to define up to ten VMSC terminating CAMEL subscription data per CAMEL phase for a subscriber or for a CAMEL subscription profile.

When the first CAMEL subscription data is initiated for a mobile subscriber or a CAMEL subscription profile, a set of default values for CAMEL subscription options and extended CAMEL data are defined: default value 0 is assigned for each CAMEL subscription option, and value 0 (meaning not assigned) is applied to each extended CAMEL data.

### 5.3.1.1 HGCM I Command Description

HGCM I :  $\left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{CSP=csp} \end{array} \right] + \left[ \begin{array}{l} \text{MMTDP=mmtdp} \dots [ , \text{SK=sk} ] [ , \text{GSA=gsa} ] \\ \text{DSTDP=dstdp}, \text{DIALNUM=dialnum} \\ \text{TSMSTDP=tsmstdp} \\ \text{OSMSTDP=osmstdp} \\ \text{GPRSTDP=gprstdp} \\ \text{OCTDP=octdp} \\ \text{TCTDP=tctdp} [ , \text{I=i} ] \\ \text{VTDP=vtdp} \end{array} \right] + , \text{SK=sk}, \text{GSA=gsa}, \text{DEH=deh} +$   
  
 $[ , \text{CCH=cch} ] ;$

### Example of an HGCM I Command

HGCM I : CSP=25 , OCTDP=2 , SK=1234333 , GSA=98765432 , DEH=0 , CCH=2 ;

The service key 1234333 and the GSM service control function address 98765432 are associated to the originating TDP 2, CAMEL phase 2, for CAMEL subscription profile number 25. If error in the dialogue between GSM service control function and GSM service switching function the call is released.

#### 5.3.1.1.1 HGCM I Parameters

The following table explains the parameters for the HGCM I command.

Table 18 HGCM I Parameters

Parameter	Type	Description
cch	Integer 1-4 CAMEL Phase	CAMEL capability handling
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)





Parameter	Type	Description
deh	Integer 0-1  0 = Transaction released in case of error in the Global System for Mobile Communication (GSM) service control function to GSM or General Packet Radio Service (GPRS) service switching function dialogue  1 = Transaction continued in case of error in the GSM service control function to GSM or GPRS service switching function dialogue	Default error handling
dialnum	Expressed as na-dial where: na: Nature of address indicator 0: Unknown 1: Not used 2: Not used 3: National number 4: International number  dial: Dialed number series. Text string 1-15 characters. Only digits 0-9, *, #, a, b, and c are allowed as characters.  Example: 3-122#4 <sup>(1)</sup>	Dialed number
dstdp	Integer 1-10	Dialed service CAMEL Trigger Detection Point (TDP)
gprstdp	Integer 0-255 <sup>(2)</sup>	GPRS CAMEL TDP
gsa	Digit string 3-15. Each digit is 0-9.	GSM service control function address
i	Y - Terminating CAMEL subscription data for the given TDP is not sent to the Gateway Mobile Switching Center (GMSC) when the subscriber is roaming inside the Home Public Land Mobile Network (HPLMN)  N - Terminating CAMEL subscription data for the given TDP is always sent to the GMSC	Inhibition indicator
mmtdp	Integer 0-255	Mobility management CAMEL TDP
msisdn	Digit string, 5-15 digits (value range for each digit: 0-9)	Mobile Subscriber ISDN Number
octdp	Integer 0-255	Originating CAMEL TDP
osmstdp	Integer 0-255	Originating Short Message Service (SMS) CAMEL TDP
sk	Integer 0-2,147,483,647	Service key
tctdp	Integer 0-255	Terminating CAMEL TDP



Parameter	Type	Description
tsmstdp	Integer 0-255	Terminating SMS CAMEL TDP
vttdp	Integer 0-255	Visited Mobile Switching Center (VMSC) terminating CAMEL TDP

(1) *dial* is a text string and must use " delimiter in MML command, for example, 3 - "122#4".

(2) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.3.1.2 HGCM I Printout

This section lists all HGCM I printouts.

#### 5.3.1.2.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

#### 5.3.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.3.1.2.3 Result Printout

This command has no result printouts.

### 5.3.2 Home Location Register, CAMEL Subscription Data, Change (HGCM C)

This command changes CAMEL subscription data for a mobile subscriber or for a CAMEL subscription profile.

The parameter CCH is used to indicate which CAMEL phase the changed subscription data is valid for.

When the parameter MMTDP has been given in the command, only CCH parameter value 3 is accepted. If the parameter CCH is not present, value 3 is assigned by default.

When the parameter DSTDP has been given in the command, only CCH parameter value 3 is accepted. If the parameter CCH is not present, value 3 is assigned by default.

When the parameter TSMSTD P has been given in the command, only CCH parameter value 4 is accepted for the command. If the parameter CCH is not present, value 4 is assigned by default.



When the parameter `OSMSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

When the parameter `GPRSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

When the parameter `OCTDP` has been given in the command with the value 4, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in this case value 3 is assigned by default. For other value of parameter `OCTDP`, `CCH` parameter values 1, 2, 3 or 4 are accepted. If parameter `CCH` is not present in this case, value 1 is assigned by default.

When the parameter `TCTDP` has been given in the command with the value 13 or 14, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in this case value 3 is assigned by default. For other value of parameter `TCTDP`, `CCH` parameter values 1, 2, 3 or 4 are accepted. If parameter `CCH` is not present in this case, value 1 is assigned by default.

When the parameter `VTTDP` has been given in the command, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `SK` is present, the new service key is associated to the specified TDP for the mobile subscriber or for the CAMEL subscription profile and the specified CAMEL phase. Except when the parameter `MMTDP` is given in the command, then the new service key is associated to all mobility management TDPs for the mobile subscriber or for the CAMEL subscription profile.

If the parameter `GSA` is present, the new GSM service control function address is associated to the specified TDP, for the mobile subscriber or for the CAMEL subscription profile and the specified CAMEL phase. Except when the parameter `MMTDP` is given in the command, then the new GSM service control function address is associated to all mobility management TDPs for the mobile subscriber or for the CAMEL subscription profile.

If the parameter `DEH` is present, only allowed along with parameter `DSTDP`, `OCTDP`, `TCTDP`, `GPRSTDP`, `OSMSTDP`, `TSMSTDP`, or `VTTDP`, the new default error handling is associated to the specified TDP, for the mobile subscriber or for the CAMEL subscription profile and the specified CAMEL phase.

If the parameter `I` is present, only allowed along with parameter `TCTDP`, the changed inhibition indicator is associated to the specified TDP, for the mobile subscriber or for the CAMEL subscription profile.

If any parameter is not present, it remains unchanged.



### 5.3.2.1 HGCMC Command Description

$$\text{HGCMC:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{CSP=csp} \end{array} \right] + \left[ \begin{array}{l} \text{MMTDP=mmtdp} \\ \text{DSTDP=dstdp} \\ \text{TSMSTDP=tsmstdp} \\ \text{OSMSTDP=osmstdp} \\ \text{GPRSTDP=gprstdp} \\ \text{OCTDP=octdp} \\ \text{TCTDP=tctdp [, I=i]} \\ \text{VTTDP=vttdp} \end{array} \right] + \left[ \text{[, SK=sk] [, GSA=gsa] [, DEH=deh] [, I=i]} \right] + \left[ \text{[, CCH=cch]} \right];$$

#### Example of an HGCMC Command

HGCMC:CSP=25,TCTDP=12,SK=250,GSA=434566765,I=N,CCH=4;

Service key 250 and the GSM service control function address 434566765 are associated to the terminating TDP 12, CAMEL phase 4, for the CAMEL subscription profile number 25. Terminating CAMEL subscription data is always sent to GMSC.

#### 5.3.2.1.1 HGCMC Parameters

The following table contains the parameters for the HGCMC command.

Table 19 HGCMC Parameters

Parameter	Type	Description
cch	Integer 1-4 <sup>(1)</sup> CAMEL Phase	CAMEL capability handling
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)
deh	Integer 0-1  0 = Transaction released in case of error in the Global System for Mobile Communication (GSM) service control function to GSM or General Packet Radio Service (GPRS) service switching function dialogue.  1 = Transaction continued in case of error in the GSM service control function to GSM or GPRS service switching function dialogue.	Default error handling
dstdp	Integer 1-10	Dialled service CAMEL TDP
gprstdp	Integer 0-255 <sup>(2)</sup>	GPRS CAMEL TDP



Parameter	Type	Description
gsa	Digit string 0-15 digits. Each digit is 0-9.	GSM service control function address
i	Y - Terminating CAMEL subscription data for the given TDP is not sent to the Gateway Mobile Switching Center (GMSC) when the subscriber is roaming inside the Home Public Land Mobile Network (HPLMN)  N - Terminating CAMEL subscription data for the given TDP is always sent to the GMSC	Inhibition indicator
mmtdp	String MMTDP <sup>(1)</sup>	Mobility management CAMEL Trigger Detection Point (TDP)
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
octdp	Integer 0-255 <sup>(2)</sup>	Originating CAMEL TDP
osmstdp	Integer 0-255 <sup>(2)</sup>	Originating Short Message Service (SMS) CAMEL TDP
sk	Integer 0-2,147,483,647	Service key
tctdp	Integer 0-255 <sup>(2)</sup>	Terminating CAMEL TDP
tsmstdp	Integer 0-255 <sup>(2)</sup>	Terminating SMS CAMEL TDP
vttdp	Integer 0-255 <sup>(2)</sup>	Visited Mobile Switching Center (VMSC) terminating CAMEL TDP

(1) If `mmtdp` is used, `cch` can only have value 3.

(2) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.3.2.2 HGCMC Printout

This section lists all HGCMC printouts.

#### 5.3.2.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.3.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.3.2.2.3 Result Printout

This command has no result printouts.



### 5.3.3 Home Location Register, CAMEL Subscription Data, End (HGCME)

This command ends CAMEL subscription data for a mobile subscriber or for a CAMEL subscription profile.

The parameter `CCH` is used to indicate which CAMEL phase the removal of subscription data is valid for.

If the parameter `CCH` is omitted and no TDP is given in the command, default value 1 is assigned parameter `CCH`.

If parameter `CCH` is omitted, all the TDPs given in the same command parameter must belong to the same CAMEL phase.

If the parameter `CCH` is given in the command but TDP is omitted, all CAMEL subscription data for the specified phase is removed for the mobile subscriber or for the CAMEL subscription profile.

When the parameter `MMTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `MMTDP` is used, the mobility management CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 mobility management CAMEL TDPs can be specified in the command.

When the parameter `DSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `DSTDP` is used, the dialled service CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 dialled service CAMEL TDPs can be specified in the command.

When the parameter `TSMSTDP` has been given in the command, only `CCH` parameter value 4 is accepted. If the parameter `CCH` is not present, value 4 is assigned by default.

If the parameter `TSMSTDP` is used, the terminating SMS CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 terminating SMS CAMEL TDPs can be specified in the command.

When the parameter `OSMSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.



If the parameter `OSMSTDP` is used, the originating SMS CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 originating SMS CAMEL TDPs can be specified in the command.

When the parameter `GPRSTDP` has been given in the command, only `CCH` parameter value 3 is accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `GPRSTDP` is used, the GPRS CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 GPRS CAMEL TDPs can be specified in the command.

When the parameter `OCTDP` has been given in the command with the value 4, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in this case value 3 is assigned by default. For other value of parameter `OCTDP`, `CCH` parameter values 1, 2, 3 or 4 are accepted. If parameter `CCH` is not present in this case, value 1 is assigned by default.

If the parameter `OCTDP` is used, the originating CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 originating CAMEL TDPs can be specified in the command.

When the parameter `TCTDP` has been given in the command with the value 13 or 14, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present in this case value 3 is assigned by default. For other value of parameter `TCTDP`, `CCH` parameter values 1, 2, 3 or 4 are accepted. If parameter `CCH` is not present, value 1 is assigned by default.

If the parameter `TCTDP` is used, the terminating CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 terminating CAMEL TDPs can be specified in the command.

When the parameter `VTDP` has been given in the command, only `CCH` parameter values 3 or 4 are accepted. If the parameter `CCH` is not present, value 3 is assigned by default.

If the parameter `VTDP` is used, the VMSC terminating CAMEL subscription data is removed for a mobile subscriber or for a CAMEL subscription profile.

A maximum of 10 VMSC terminating CAMEL TDPs can be specified in the command.

All originating CAMEL phase 2, CAMEL phase 3, and CAMEL phase 4 TDPs are not allowed to be removed for a mobile subscriber or for a CAMEL subscription profile when the translation information flag is set for the subscriber or for the CAMEL subscription profile.



If several TDP values are given for a CAMEL TDP in a command and CCH parameter is not present, the command only is accepted in case that the CCH default parameter for all the TDP values is the same.

### 5.3.3.1 HGCME Command Description

$$\text{HGCME:} + \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{CSP=csp} \end{array} \right] + [ , \text{CCH=cch} ] + \left[ \begin{array}{l} , \text{MMTDP=mmtdp} \dots \\ , \text{DSTDP=dstdp} \dots \\ , \text{TSMSTDP=tsmstdp} \dots \\ , \text{OSMSTDP=osmstdp} \dots \\ , \text{GPRSTDP=gprstdp} \dots \\ \left[ , \text{OCTDP=octdp} \dots \right] \left[ , \text{TCTDP=tctdp} \dots \right] \\ , \text{VTDP=vtdp} \dots \end{array} \right] + ;$$

#### Example of an HGCME Command

HGCME:CSP=25,CCH=2,OCTDP=ALL,TCTDP=12;

All originating CAMEL phase 2 subscription data and terminating CAMEL phase 2 subscription data with TDP 12 are removed for the CAMEL subscription profile number 25.

#### 5.3.3.1.1 HGCME Parameters

The following table contains the parameters for the HGCME command.

Table 20 HGCME Parameters

Parameter	Type	Description
cch	Integer 1-4 CAMEL Phase	CAMEL capability handling
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)
dstdp	Integer 1-10 or String ALL	Dialled service CAMEL Trigger Detection Point (TDP)
gprstdp	Integer 0-255 <sup>(1)</sup> or String ALL	GPRS CAMEL TDP





Parameter	Type	Description
mmtdp	Integer 0-255 <sup>(1)</sup> or String ALL	Mobility management CAMEL TDP
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
octdp	Integer 0-255 <sup>(1)</sup> or String ALL	Originating CAMEL TDP
osmstdp	Integer 0-255 <sup>(1)</sup> or String ALL	Originating Short Message Service (SMS) CAMEL TDP
tctdp	Integer 0-255 <sup>(1)</sup> or String ALL	Terminating CAMEL TDP
tsmstdp	Integer 0-255 <sup>(1)</sup> or String ALL	Terminating SMS CAMEL TDP
vtt dp	Integer 0-255 <sup>(1)</sup> or String ALL	Visited Mobile Switching Center (VMSC) terminating CAMEL TDP

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.3.3.2 HGCME Printout

This section lists all HGCME printouts.

#### 5.3.3.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.3.3.2.2 Answer Printout

This command has no answer printouts.

#### 5.3.3.2.3 Result Printout

This command has no result printouts.



### 5.3.4 Home Location Register, CAMEL Subscription Data, Print (HGCMP)

This command prints CAMEL subscription data in the HLR.

If parameter `CSP` is entered, answer printout HLR CAMEL SUBSCRIPTION PROFILE DATA is received. If parameter `MSISDN` is provided, answer printout HLR CAMEL SUBSCRIPTION DATA is received. CAMEL subscription data that is used for one or all CAMEL subscription profiles containing any CAMEL subscription data are printed.

When optional parameter `OPT` is given in the command, CAMEL subscription options are printed.

When optional parameter `EXT` is given in the command, extended CAMEL data are printed.

When optional parameter `CRIT` is given in the command, CAMEL triggering criteria are printed.

Deviations:

- Parameters `CSP=ALL` and `MSISDN=ALL` are not supported in the layered solution.

#### 5.3.4.1 HGCMP Command Description

```
HGCMP: + [ MSISDN=msisdn [,OPT] [,EXT] [,CRIT];  
          CSP=csp [,OPT] [,EXT] [,CRIT]; ]
```

#### Example of an HGCMP Command

```
HGCMP:CSP=21;
```

CAMEL subscription data for CAMEL subscription profile number 21 is printed.

##### 5.3.4.1.1 HGCMP Parameters

The following table contains the parameters for the HGCMP command.

*Table 21 HGCMP Parameters*

Parameter	Type	Description
csp	Integer 1–8160	CAMEL Subscription Profile
crit	-	CAMEL triggering criteria
ext	-	Extended CAMEL data

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
opt	-	CAMEL subscription options

5.3.4.2

HGCMP Printout

This section lists all HGCMP printouts.

5.3.4.2.1

Procedure Printout

NOT ACCEPTED  
fault type

5.3.4.2.2

Answer Printout

If parameter CSP is provided, the answer printout is as follows:

HLR CAMEL SUBSCRIPTION PROFILE DATA

HLR CAMEL SUBSCRIPTION PROFILE DATA																											
CSP																											
csp																											
TDPTYPE	TDP	SK	GSA			DEH	CCH I	DIALNUM																			
tdptype	tdp	sk	gsa			[deh]	cch[i]	[dialnum]																			
.	.	.	.			.	.	.	.																		
.	.	.	.			.	.	.	.																		
.	.	.	.			.	.	.	.																		
tdptype	tdp	sk	gsa			[deh]	cch[i]	[dialnum]																			
CAMEL SUBSCRIPTION OPTIONS																											
<table><tr><td>GC3SO</td><td>MC3SO</td></tr><tr><td>gc3so</td><td>mc3so</td></tr></table>					GC3SO	MC3SO	gc3so	mc3so	<table><tr><td>GC2SO</td><td>MC2SO</td><td>TIF</td></tr><tr><td>gc2so</td><td>mc2so</td><td>[tif]</td></tr></table>					GC2SO	MC2SO	TIF	gc2so	mc2so	[tif]	<table><tr><td>GPRSSO</td></tr><tr><td>gprssso</td></tr></table>		GPRSSO	gprssso	<table><tr><td>OSMSSO</td></tr><tr><td>osmssso</td></tr></table>		OSMSSO	osmssso
GC3SO	MC3SO																										
gc3so	mc3so																										
GC2SO	MC2SO	TIF																									
gc2so	mc2so	[tif]																									
GPRSSO																											
gprssso																											
OSMSSO																											
osmssso																											
<table><tr><td>GC3SO</td><td>MC3SO</td></tr><tr><td>gc3so</td><td>mc3so</td></tr></table>					GC3SO	MC3SO	gc3so	mc3so	<table><tr><td>GC4SO</td><td>MC4SO</td></tr><tr><td>gc4so</td><td>mc4so</td></tr></table>					GC4SO	MC4SO	gc4so	mc4so										
GC3SO	MC3SO																										
gc3so	mc3so																										
GC4SO	MC4SO																										
gc4so	mc4so																										
<table><tr><td>MMSO</td></tr><tr><td>mmsso</td></tr></table>		MMSO	mmsso	<table><tr><td>TSMSSO</td></tr><tr><td>tsmssso</td></tr></table>								TSMSSO	tsmssso														
MMSO																											
mmsso																											
TSMSSO																											
tsmssso																											
EXTENDED CAMEL DATA																											
<table><tr><td>EOINCI</td><td>EOICK</td><td>ETINCI</td><td>ETICK</td></tr><tr><td>eoinci</td><td>eoick</td><td>etinci</td><td>etick</td></tr></table>				EOINCI	EOICK	ETINCI	ETICK	eoinci	eoick	etinci	etick																
EOINCI	EOICK	ETINCI	ETICK																								
eoinci	eoick	etinci	etick																								



```
CAMEL TRIGGERING CRITERIA DATA
[
  TRIGGERING CRITERIA DATA FOR OCTDP 2
  MTY  DNUM                DLGH  FTC  BS    BSG  CCH
  [mty] [dnum]              [dlgh] [ftc] [bs]  [bsg] [cch]
        [  .  ]              [  .  ]      [  .  ] [  .  ]
        [  .  ]              [  .  ]      [  .  ] [  .  ]
        [dnum]              [dlgh]      [bs]  [bsg]
        [  .  ]
        [  .  ]
        [  .  ]
  [mty] [dnum]              [dlgh] [ftc] [bs]  [bsg] [cch]
        [  .  ]              [  .  ]      [  .  ] [  .  ]
        [  .  ]              [  .  ]      [  .  ] [  .  ]
        [dnum]              [dlgh]      [bs]  [bsg]
        [  .  ]
        [  .  ]
        [  .  ]

  TRIGGERING CRITERIA DATA FOR TCTDP 12
  BS    BSG  CCH
  [bs]  [bsg] [cch]
  [  .  ] [  .  ]
  [  .  ] [  .  ]
  [  .  ] [  .  ]
  [bs]  [bsg]
  [  .  ]
  [  .  ]
  [  .  ]
  [bs]  [bsg] [cch]
  [  .  ] [  .  ]
  [  .  ] [  .  ]
  [  .  ] [  .  ]
  [bs]  [bsg]

  [NO TRIGGERING CRITERIA DATA]
]

END
```

If parameter `MSISDN` is provided, the answer printout is as follows:

#### HLR CAMEL SUBSCRIPTION DATA



HLR CAMEL SUBSCRIPTION DATA									
MSISDN			CSP						
msisdn			[csp]						
TDPTYPE	TDP	SK	GSA			DEH	CCH I	DIALNUM	
tdptype	tdp	sk	gsa			[deh]	cch[i]	[dialnum]	
.	.	.	.			.	.	.	.
.	.	.	.			.	.	.	.
.	.	.	.			.	.	.	.
tdptype	tdp	sk	gsa			[deh]	cch[i]	[dialnum]	

CAMEL SUBSCRIPTION OPTIONS

GCSO MCSO SSLO GC2SO MC2SO TIF

gcso mcso sslo gc2so mc2so [tif]

GPRSSO

gprssso

OSMSSO

osmssso

GC3SO MC3SO

gc3so mc3so

GC4SO MC4SO

gc4so mc4so

MMSO

mmso

TSMSSO

tsmssso

EXTENDED CAMEL DATA

EOINCI EOICK ETINCI ETICK

eoinci eoick etinci etick



```
CAMEL TRIGGERING CRITERIA DATA
[
  TRIGGERING CRITERIA DATA FOR OCTDP 2
  MTY  DNUM          DLGH  FTC  BS    BSG  CCH
  [mty] [dnum]        [dlgh] [ftc] [bs]  [bsg] cch
        [ .
        [ .
        [ .
        [ dnum
        [ dlgh
        [ bs
        [ bsg

  .
  .
  .

  [mty] [dnum]        [dlgh] [ftc] [bs]  [bsg] cch
        [ .
        [ .
        [ .
        [ dnum
        [ dlgh
        [ bs
        [ bsg

  TRIGGERING CRITERIA DATA FOR TCTDP 12
  BS    BSG  CCH
  [bs]  [bsg] cch
        [ .
        [ .
        [ .
        [ bs
        [ bsg

  .
  .
  .

  [bs]  [bsg] cch
        [ .
        [ .
        [ .
        [ bs
        [ bsg

  [NO TRIGGERING CRITERIA DATA]
]

END
```

The following table contains information about the parameters in the HGCMP answer printout:

*Table 22 HGCMP Answer Printout Parameters*

Parameter	Type	Description
bs	String <sup>(1)</sup>	Basic Service (BS)
bsg	String <sup>(1)</sup>	Basic Service Group (BSG)



Parameter	Type	Description
cch	Integer 1–4 CAMEL Phase	CAMEL capability handling
csp	Integer 1–8160	CAMEL Subscription Profile
deh	Integer 0-1  0 = Transaction released in case of error in the Global System for Mobile Communication (GSM) service control function to GSM or General Packet Radio Service (GPRS) service switching function dialogue.  1 = Transaction continued in case of error in the GSM service control function to GSM or GPRS service switching function dialogue.	Default error handling
dialnum	Expressed as na-dial where: na: Nature of address indicator 0: Unknown 1: Not used 2: Not used 3: National number 4: International number  dial: Dialed number series. Text string 1-15 characters. Only digits 0-9, *, #, a, b, and c are allowed as characters.  Example: 3-122#4	Dialed number
dlgh	Integer 0-15	Destination number length
dnum	Expressed as na-dn where: na: Nature of address (NA) indicator 0: Unknown 1: Not used 2: Not used 3: National number 4: International number  dn: Destination number series. Text string 1-15 characters. Only digits, * and # are allowed as characters.	Destination number
eoick	Integer 0-999 Value 0 means not assigned.	Extended originating intelligent network category key
eoinci	Integer 0-255 Value 0 means not assigned.	Extended originating intelligent network capability indicator



Parameter	Type	Description
etick	Integer 0-999 Value 0 means not assigned.	Extended terminating intelligent network category key
etinci	Integer 0-255 Value 0 means not assigned.	Extended terminating intelligent network capability indicator
ftc	String F (Forwarding) or N (Not forwarding).	Forwarding triggering criteria
gcso	Integer 0-1  0 = Allow call terminating handling without CAMEL invocation when CAMEL phase 1 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 1 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 1 support subscription option
gc2so	Integer 0-1  0 = Allow call terminating handling with CAMEL phase 1 invocation when CAMEL phase 2 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply Operator Determined Barring (ODB) of all incoming calls when CAMEL phase 2 is not supported in the interrogating GMSC/gsmSCF.	Gateway Mobile Switching Center (GMSC) / Global System for Mobile Communication Service Control Function (gsmSCF) CAMEL phase 2 support subscription option
gc3so	Integer 0-1  0 = Allow call terminating handling with lower CAMEL phase invocation when CAMEL phase 3 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 3 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 3 support subscription option
gc4so	Integer 0-1  0 = Allow call terminating handling with lower CAMEL phase invocation when CAMEL phase 4 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 4 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 4 support subscription option





Parameter	Type	Description
gprso	Integer 0-1  0 = Allow mobile subscribers registration in the Serving GPRS Support Node (SGSN) without sending GPRS CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the SGSN.  1 = Deny mobile subscribers registration in the SGSN when CAMEL phase 3 data is not allowed to be sent to the SGSN.	GPRS CAMEL phase 3 denied subscription option
gsa	Digit string 0-15 digits. Each digit is 0-9.	GSM service control function address
i	Y - Terminating CAMEL subscription data for the given TDP is not sent to the Gateway Mobile Switching Center (GMSC) when the subscriber is roaming inside the Home Public Land Mobile Network (HPLMN)  N - Terminating CAMEL subscription data for the given TDP is always sent to the GMSC	Inhibition indicator
mcs0	Integer 0-2  0 = Allow mobile subscribers registration in the serving MSC/VLR without sending CAMEL data when CAMEL phase 1 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 1 data is not allowed to be sent to the serving MSC/VLR.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 1 data is not allowed to be sent to the MSC/VLR.	Mobile Switching Center (MSC) / Visitor Location Register (VLR) CAMEL phase 1 denied subscription option
mc2so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with CAMEL phase 1 data can be performed or register without CAMEL data when CAMEL phase 2 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service Barring of All Outgoing Calls (BAOC) performed when CAMEL phase 2 data is not allowed to be sent to the serving MSC/VLR.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 2 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 2 denied subscription option



Parameter	Type	Description
mc3so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with lower CAMEL phase data can be performed or register without CAMEL data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 3 data is not allowed to be sent to the serving MSC/VLR. For Visited MSC (VMSC) terminating CAMEL TDPs, value 1 has the same meaning as value 0.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 3 denied subscription option
mc4so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with lower CAMEL phase data can be performed or register without CAMEL data when CAMEL phase 4 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 4 data is not allowed to be sent to the serving MSC/VLR. For VMSC terminating CAMEL TDPs, value 1 has the same meaning as value 0..  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 4 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 4 denied subscription option
mmsso	Integer 0-1  0 = Allow mobile subscribers registration in the serving MSC/VLR without sending mobility management CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.  1 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.	Mobility management CAMEL phase 3 denied subscription option
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
mtty	String I (Inhibiting) or E (Enabling)	Match type



Parameter	Type	Description
osmssso	Integer 0-2  0 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending originating SMS CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.  1 = Network induced service withdrawal of Teleservice Short Message MO/PP performed when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.  2 = Deny mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.	Originating Short Message Service (SMS) CAMEL phase 3 denied subscription option
sk	Integer 0-2,147,483,647	Service key
sslo	Integer 0-1  0 = Subscriber state and location information are not sent at Send Routing Information Mobile Application Part (MAP) version 3 message response.  1 = Subscriber state and location information are sent at Send Routing Information MAP version 3 message response.	Subscriber state and location information sending CAMEL subscription option
tdp	Integer 0-14  The value range depends on $tdptype^{(1)}$	Trigger Detection Point (TDP)
tdptype	Enumeration string with one of the following values:  <ul style="list-style-type: none"> <li>• DSTDP</li> <li>• GPRSTDP</li> <li>• MMTDP</li> <li>• OCTDP</li> <li>• OSMSTDP</li> <li>• TCTDP</li> <li>• TSMSTDP</li> <li>• VTTDP</li> </ul>	Type of TDP



Parameter	Type	Description
tif	Integer 0-1  0 = Number length, format, and conditional barrings checks are performed, when the mobile subscriber or the service provider registers a forwarded-to number.  1 = Number length, format, and conditional barrings checks are not performed, when the mobile subscriber or the service provider registers a forwarded-to number.	Translation information flag
tsmsso	Integer 0-2  0 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending terminating SMS CAMEL phase 4 data, when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR, or SGSN, or both.  1 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending terminating SMS CAMEL phase 4 data, when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR or SGSN or both. Network induced service invocation of an incoming call barring service is applied to mobile terminating short message delivery through MSC, or SGSN, or both.  2 = Deny mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR, or SGSN, or both	Terminating SMS CAMEL phase 4 denied subscription option

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

#### 5.3.4.2.3

#### Result Printout

This command has no result printouts.

## 5.4

## HGCE: CAMEL Extended Information

This section covers the following MML HLR command:

- Home Location Register, Customized Applications for Mobile Networks Enhanced Logic (CAMEL) Extended Information, Change (HGCEC) (Section 5.4.1 on page 56)



#### 5.4.1 Home Location Register, CAMEL Extended Information, Change (HGCEC)

This command changes the CAMEL subscription options as well as extended CAMEL data for a mobile subscriber or for a CAMEL subscription profile with CAMEL subscription data defined.

Change of CAMEL subscription options is allowed only if the subscriber or the CAMEL subscription profile has any CAMEL subscription data defined.

Change of extended terminating CAMEL data is allowed only if terminating CAMEL subscription data is defined for the mobile subscriber or for the CAMEL subscription profile.

Change of extended originating CAMEL data is allowed only if originating CAMEL subscription data is defined for the mobile subscriber or for the CAMEL subscription profile.

Since parameters `ETINCI` and `ETICK` are mutually exclusive, when one of them is changed the other one is set to not assigned.

Since parameters `EOINCI` and `EOICK` are mutually exclusive, when one of them is changed the other one is set to not assigned.

Change of parameter `TIF` is allowed only if the subscriber or the CAMEL subscription profile has any originating CAMEL phase 2 or higher subscription data defined.



### 5.4.1.1 HGCEC Command Description

$$\text{HGCEC:} + \left[ \begin{array}{c} \text{MSISDN=msisdn} \\ \text{CSP=csp} \end{array} \right] + \left[ \begin{array}{c} [,SSLO=sslo] [,GC3SO=gc3so] \\ [,GC2SO=gc2so] [,GC4SO=gc4so] [,TIF=tif] [,GPRSSO=gprssso] \\ [,OSMSSO=osmssso] [,TSMSSO=tsmssso] [,MMSO=mmso] \end{array} \right] , + \left[ \begin{array}{c} \text{MC4SO=mc4so} \\ \text{MC3SO=mc3so} \\ \text{MC2SO=mc2so} \\ \text{MCSO=mcso} \end{array} \right] + \left[ \begin{array}{c} \left[ \begin{array}{c} \text{ETINCI=etinci} \\ \text{ETICK=etick} \end{array} \right] + \left[ \begin{array}{c} \text{EOINCI=eoinci} \\ \text{EOICK=eoick} \end{array} \right] \\ \end{array} \right] + ;$$

#### Example of an HGCEC Command

HGCEC:CSP=3,MC3SO=0,GC3SO=0,TIF=0;

A check if registration with lower CAMEL phase is performed or register without CAMEL data when CAMEL phase 3 data is not allowed to be sent to the Mobile Switching Center (MSC)/Visitor Location Register (VLR). Call terminating handling with lower CAMEL phase invocation when CAMEL phase 3 is not supported in the interrogating GMSC/gsmSCF, is applied. When the subscriber or the service provider registers a forwarded-to number, number length, format, and conditional barring checks are performed on the forwarded-to number. All these actions are performed for CAMEL subscription profile number 3.

#### 5.4.1.1.1 HGCEC Parameters

The following table contains the parameters for the HGCEC command.

Table 23 HGCEC Parameters

Parameter	Type	Description
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)



Parameter	Type	Description
eoinci	Integer 0-999 Value 0 means not assigned.	Extended originating intelligent network capability indicator
eoick	Integer 0-999 Value 0 means not assigned.	Extended originating intelligent network category key
etinci	Integer 0-255 Value 0 means not assigned.	Extended terminating intelligent network capability indicator
etick	Integer 0-255 Value 0 means not assigned.	Extended terminating intelligent network category key
gcso	Integer 0-1  0 = Allow call terminating handling without CAMEL invocation when CAMEL phase 1 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 1 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 1 support subscription option
gc2so	Integer 0-1  0 = Allow call terminating handling with CAMEL phase 1 invocation when CAMEL phase 2 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply Operator Determined Barring (ODB) of all incoming calls when CAMEL phase 2 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 2 support subscription option
gc3so	Integer 0-1  0 = Allow call terminating handling with lower CAMEL phase invocation when CAMEL phase 3 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 3 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 3 support subscription option
gc4so	Integer 0-1  0 = Allow call terminating handling with lower CAMEL phase invocation when CAMEL phase 4 is not supported in the interrogating GMSC/gsmSCF.  1 = Apply ODB of all incoming calls when CAMEL phase 4 is not supported in the interrogating GMSC/gsmSCF.	GMSC gsmSCF CAMEL phase 4 support subscription option



Parameter	Type	Description
gprssso	Integer 0-1  0 = Allow mobile subscribers registration in the Serving GPRS Support Node (SGSN) without sending GPRS CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the SGSN.  1 = Deny mobile subscribers registration in the SGSN when CAMEL phase 3 data is not allowed to be sent to the SGSN.	GPRS CAMEL phase 3 denied subscription option
mcsso	Integer 0-2  0 = Allow mobile subscribers registration in the serving MSC/VLR without sending CAMEL data when CAMEL phase 1 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 1 data is not allowed to be sent to the serving MSC/VLR.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 1 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 1 denied subscription option
mc2so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with CAMEL phase 1 data can be performed or register without CAMEL data when CAMEL phase 2 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service Barring of All Outgoing Calls (BAOC) performed when CAMEL phase 2 data is not allowed to be sent to the serving MSC/VLR.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 2 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 2 denied subscription option





Parameter	Type	Description
mc3so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with lower CAMEL phase data can be performed or register without CAMEL data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 3 data is not allowed to be sent to the serving MSC/VLR. For Visited MSC (VMSC) terminating CAMEL Trigger Detection Points (TDPs) value 1 has the same meaning as value 0.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 3 denied subscription option
mc4so	Integer 0-2  0 = Check if mobile subscribers registration in the serving MSC/VLR with lower CAMEL phase data can be performed or register without CAMEL data when CAMEL phase 4 data is not allowed to be sent to the MSC/VLR.  1 = Network induced activation of supplementary service BAOC performed when CAMEL phase 4 data is not allowed to be sent to the serving MSC/VLR. For VMSC terminating CAMEL TDPs value 1 has the same meaning as value 0.  2 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 4 data is not allowed to be sent to the MSC/VLR.	MSC/VLR CAMEL phase 4 denied subscription option
mmso	Integer 0-1  0 = Allow mobile subscribers registration in the serving MSC/VLR without sending mobility management CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.  1 = Deny mobile subscribers registration in the serving MSC/VLR when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR.	Mobility management CAMEL phase 3 denied subscription option
msisdn	Digit string 5–15 digits (value range for each digit: 0–9).	Mobile Subscriber ISDN Number



Parameter	Type	Description
osmssso	Integer 0-2  0 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending originating SMS CAMEL phase 3 data when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.  1 = Network induced service withdrawal of Teleservice Short Message MO/PP performed when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.  2 = Deny mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) when CAMEL phase 3 data is not allowed to be sent to the MSC/VLR or SGSN.	Originating Short Message Service (SMS) CAMEL phase 3 denied subscription option
sslo	Integer 0-1  0 = Subscriber state and location information are not sent at Send Routing Information Mobile Application Part (MAP) version 3 message response.  1 = Subscriber state and location information are sent at Send Routing Information MAP version 3 message response.	Subscriber state and location information sending CAMEL subscription option



Parameter	Type	Description
tif	Integer 0-1  0 = Number length, format, and conditional barring checks are performed, when the mobile subscriber or the service provider registers a forwarded-to number.  1 = Number length, format, and conditional barring checks are not performed, when the mobile subscriber or the service provider registers a forwarded-to number.	Translation information flag
tsmsso	Integer 0-2  0 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending terminating SMS CAMEL phase 4 data, when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR, or SGSN, or both.  1 = Allow mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) without sending terminating SMS CAMEL phase 4 data, when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR or SGSN or both. Network induced service invocation of an incoming call barring service is applied to mobile terminating short message delivery through MSC, or SGSN, or both.  2 = Deny mobile subscribers registration in the serving node (MSC/VLR or SGSN or both) when terminating SMS CAMEL phase 4 data is not allowed to be sent to the MSC/VLR, or SGSN, or both.	Terminating SMS CAMEL phase 4 denied subscription option

### 5.4.1.2 HGCEC Printout

This section lists all HGCEC printouts.

#### 5.4.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.4.1.2.2 Answer Printout

This command has no answer printouts.



## 5.4.1.2.3

## Result Printout

This command has no result printouts.

## 5.5

## HGCS: Closed User Group Basic Service Group Options

This section covers the following MML HLR commands:

- Home Location Register, Closed User Group Basic Service Group Options, Change (HGCS) (Section 5.5.1 on page 64)
- Home Location Register, Closed User Group Basic Service Group Options, Print (HGCS) (Section 5.5.2 on page 65)

## 5.5.1

### Home Location Register, Closed User Group Basic Service Group Options, Change (HGCS)

This command changes basic service group options of the closed user group for a mobile subscriber member of closed user group(s).

The basic service group options of the closed user group are the inter closed user group accessibility (**ACCESS**) and preferential closed user group index (**PCUG**).

If the parameter **BSG** is not specified, the changes are applied to all basic service groups defined within the closed user group(s) for the mobile subscriber.

## 5.5.1.1

#### HGCS Command Description

$$\text{HGCS:MSISDN=msisdn[,BSG=bsg...]} + \left[ \text{,ACCESS=access} \right] \left[ \text{,PCUG=+} \begin{array}{c} \left[ \text{pcug} \right] \\ \text{+} \\ \left[ \text{NONE} \right] \end{array} \right] + ;$$

#### Example of an HGCS Command

```
HGCS:MSISDN=345678901234567,BSG="TS10&TS60",ACCESS="OIA",PCUG=3;
```

In the example above, the outgoing and incoming access and preferential closed user group index 3 are given to basic service groups **Speech Transmission** (TS10) and **Facsimile** (TS60) for the mobile subscriber 345678901234567.



### 5.5.1.2 HGCSC Parameters

The following table contains the parameters for the HGCSC command.

*Table 24 HGCSC Parameters*

Parameter	Type	Description
access	Enumeration value: <ul style="list-style-type: none"> <li>• OA</li> <li>• IA</li> <li>• OIA</li> <li>• NONE</li> </ul>	The inter closed user group accessibility
bsg	String <sup>(1)</sup>	The BSG identifier
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
pcug	One of the following values: <ul style="list-style-type: none"> <li>• Integer, value range: Integer 0–32,767</li> <li>• String, NONE</li> </ul>	The preferential closed user group index

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.5.1.3 HGCSC Printout

This section lists all HGCSC printouts.

#### 5.5.1.3.1 Check Printout

Yes.

#### 5.5.1.3.2 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.5.1.3.3 Answer Printout

This command has no answer printouts.

#### 5.5.1.3.4 Result Printout

This command has no result printouts.



## 5.5.2 Home Location Register, Closed User Group Basic Service Group Options, Print (HGCSP)

The command HGCSP initiates the printout of HLR closed user group basic service group options data. This command is used to print the existing basic service group options of closed user group for one or all mobile subscribers that are members of any closed user group.

Deviation:

- This command does not support `MSISDN=ALL`.

### 5.5.2.1 HGCSP Command Description

```
HGCSP:MSISDN=msisdn;
```

#### Example of an HGCSP Command

```
HGCSP:MSISDN=345678901234567;
```

In the example above, the closed user group basic service group options for the mobile subscriber 345678901234567 are printed.

### 5.5.2.2 HGCSP Parameters

The following table lists the parameter for the HGCSP command.

Table 25 HGCSP Parameter

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number

### 5.5.2.3 HGCSP Printout

This section lists all HGCSP printouts.

#### 5.5.2.3.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

#### 5.5.2.3.2 Answer Printout

The answer printout of HLR closed user group basic service group options data are shown as follows:



```
HLR CLOSED USER GROUP BASIC SERVICE GROUP OPTIONS DATA
```

```
MSISDN      BSG      ACCESS  PCUG
msisdn      bsg      access  pcug
.
.
.
.
bsg      access  pcug
```

```
[NONE]
```

```
END
```

The following table contains information about the parameters in the HGCSF answer printout.

**Table 26** *HGCSF Answer Printout Parameters*

Parameter	Type	Description
access	Enumeration value: <ul style="list-style-type: none"> <li>• OA</li> <li>• IA</li> <li>• OIA</li> <li>• NONE</li> </ul>	The inter closed user group accessibility
bsg	String Possible values, and explanations for them, can be found in <i>HLR Subscriber Data Type Definitions</i> , Reference [6].	The BSG identifier
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
pcug	One of the following values: <ul style="list-style-type: none"> <li>• Integer, value range: Integer 0–32,767</li> <li>• String, NONE</li> </ul>	The preferential closed user group index

### 5.5.2.3.3 Result Printout

This command has no result printouts.

## 5.6 HGCT: CAMEL Triggering Criteria

This section covers the following MML HLR commands:

- Home Location Register, CAMEL Triggering Criteria, Initiate (HGCTI) (Section 5.6.1 on page 67)
- Home Location Register, CAMEL Triggering Criteria, End (HGCTE) (Section 5.6.2 on page 70)



### 5.6.1 Home Location Register, CAMEL Triggering Criteria, Initiate (HGCTI)

This command initiates CAMEL triggering criteria for a mobile subscriber or for a CAMEL subscription profile with CAMEL subscription data defined in the HLR.

The parameter `CCH` is used to indicate which CAMEL phase the subscription data is valid for. If the parameter `CCH` is not present, value 2 is assigned by default.

If the parameter `OCTDP2` is used, the CAMEL triggering criteria are defined for originating CAMEL TDP “Collected Info”. It is allowed only if originating CAMEL subscription information defined for the subscriber or for the CAMEL subscription profile, includes TDP “Collected Info” for the specified CAMEL phase.

If the parameter `TCTDP12` is used, the CAMEL triggering criteria are defined for terminating CAMEL TDP “Terminating Attempt Authorized”. It is allowed only if terminating CAMEL subscription information defined for the subscriber or for the CAMEL subscription profile includes TDP “Terminating Attempt Authorized” for the specified CAMEL phase.

The parameters `MTY`, `DNUM`, and `DLGH` are used to define destination number triggering criteria.

Parameter `MTY` must only be entered when the first destination number triggering criteria is defined. This parameter indicates whether the criterion is inhibiting or enabling the specified destination number or destination number length.

It is possible to define up to 10 destination numbers, 3 destination number lengths, and 5 `BS` triggering criteria for a subscriber or for a CAMEL subscription profile with TDP “Collected Info”.

It is possible to define up to 5 `BS` triggering criteria for a subscriber or for a CAMEL subscription profile with TDP “Terminating Attempt Authorized”.





### 5.6.1.1 HGCTI Command Description



#### Example of an HGCTI Command

```

HGCTI:CSP=12,CCH=3,OCTDP2,MTY=I,DNUM=0-"*21*678902000#",
      DLGH=3&4&5;

```

Triggering criteria for CAMEL subscription profile number 12 is initiated for originating CAMEL phase 3 TDP “Collected Info” with match type 'Inhibiting', destination number series \*21\*678902000# with unknown nature of address, and destination number lengths 3, 4 or 5.

#### 5.6.1.1.1 HGCTI Parameters

The following table contains the parameters for the HGCTI command.

*Table 27 HGCTI Parameters*

Parameter	Type	Description
bs	String <sup>(1)</sup>	BS
bsg	String <sup>(1)</sup>	BSG
cch	Integer 1-4 CAMEL Phase	CAMEL capability handling.
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)



Parameter	Type	Description
dnum	Expressed as na-dn where: na: Nature of address (NA) indicator 0: Unknown 1: Not used 2: Not used 3: National number 4: International number dn: Destination number series. Text string 1-15 characters. Only digits, * and # are allowed as characters. Example: 0-*21*678902000# <sup>(2)</sup>	Destination number
dlgh	Integer 0-15	Destination number length
ftc	String F (Forwarding) or N (Not forwarding)	Forwarding triggering criteria
msisdn	Digit string 5–15 digits (value range for each digit: 0–9).	Mobile Subscriber ISDN Number
mtv	String I (Inhibiting) or E (Enabling)	Match type
OCTDP2	-	Originating CAMEL Trigger Detection Point (TDP)
TCTDP12	-	Terminating CAMEL TDP Terminating Attempt Authorized

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

(2) dn is a text string and must use " delimiter in MML command, for example,  
0- "\*21\*678902000#".

## 5.6.1.2 HGCTI Printout

This section lists all HGCTI printouts.

### 5.6.1.2.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

### 5.6.1.2.2 Answer Printout

This command has no answer printouts.

### 5.6.1.2.3 Result Printout

This command has no result printouts.



## 5.6.2 Home Location Register, CAMEL Triggering Criteria, End (HGCTE)

This command ends CAMEL triggering criteria defined for a mobile subscriber or for a CAMEL subscription profile in the HLR.

The parameter `CCH` is used to indicate which CAMEL phase the subscription data is valid for. If the parameter `CCH` is not present, value 2 is assigned by default.

If no CAMEL Triggering criteria information is given, all CAMEL triggering criteria for the specified CAMEL phase are deleted for the subscriber or for the CAMEL subscription profile.

When only parameter `OCTDP2` is used, all CAMEL triggering criteria of originating CAMEL TDP “Collected Info” defined for the specified CAMEL phase are deleted for the subscriber or for the CAMEL Subscription Profile.

When only parameter `TCTDP12` is used, all CAMEL triggering criteria of terminating CAMEL TDP “Terminating Attempt Authorized” defined for the specified CAMEL phase are deleted for the subscriber or for the CAMEL Subscription Profile.

When parameter `DNUM` is given, the specified destination number is deleted from the destination number triggering criteria.

When parameter `DNUM` is given, the specified destination number is deleted from the destination number triggering criteria.

When parameter `FTC` is given, the forwarding triggering criterion is deleted.

When parameter `BS` is given, the specified BS is deleted from the specified TDP BS triggering criteria.

When parameter `BSG` is given, the specified BSG is deleted from the specified TDP BS triggering criteria.



### 5.6.2.1 HGCTE Command Description

$$\text{HGCTE:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{CSP=csp} \end{array} \right] + [ , \text{CCH=cch} ]$$
$$\left[ \begin{array}{l} \left[ \begin{array}{l} \left[ \begin{array}{l} \text{, OCTDP2} \end{array} \right] \left[ \begin{array}{l} \text{, DNUM=} \left[ \begin{array}{l} \text{dnum} \\ \text{ALL} \end{array} \right] \end{array} \right] \left[ \begin{array}{l} \text{, DLGH=} \left[ \begin{array}{l} \text{dlgh} \\ \text{ALL} \end{array} \right] \end{array} \right] [ , \text{FTC} ] \left[ \begin{array}{l} \text{, BS=} \left[ \begin{array}{l} \text{bs} \\ \text{ALL} \end{array} \right] \end{array} \right] \left[ \begin{array}{l} \text{, BSG=} \left[ \begin{array}{l} \text{bsg} \\ \text{ALL} \end{array} \right] \end{array} \right] \end{array} \right] \\ \left[ \begin{array}{l} \text{, TCTDP12} \left[ \begin{array}{l} \text{, BS=} \left[ \begin{array}{l} \text{bs} \\ \text{ALL} \end{array} \right] \end{array} \right] \left[ \begin{array}{l} \text{, BSG=} \left[ \begin{array}{l} \text{bsg} \\ \text{ALL} \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right] ;$$

#### Example of an HGCTE Command

HGCTE:CSP=127,CCH=3;

All CAMEL phase 3 triggering criteria are deleted for CAMEL subscription profile number 127.

#### 5.6.2.1.1 HGCTE Parameters

The following table contains the parameters for the HGCTE command.

Table 28 HGCTE Parameters

Parameter	Type	Description
bs	String <sup>(1)</sup> or String ALL	Basic Service (BS)
bsg	String <sup>(1)</sup> or String ALL	Basic Service Group (BSG)
cch	Integer 1-4 CAMEL Phase	CAMEL capability handling
csp	Integer 1-8160	CAMEL Subscription Profile (CSP)



Parameter	Type	Description
dnum	Expressed as na-dn where: na: Nature of address (NA) indicator 0: Unknown 1: Not used 2: Not used 3: National number 4: International number dn: Destination number series. Text string 1-15 characters. Only digits, * and # are allowed as characters. Example: 0-*21*678902000# <sup>(2)</sup>	Destination number
dlgh	Integer 0-15 or String ALL	Destination number length
ftc	String F (Forwarding) or N (Not forwarding)	Forwarding triggering criteria
msisdn	Digit string 5–15 digits (value range for each digit: 0–9).	Mobile Subscriber ISDN Number
OCTDP2	-	Originating CAMEL Trigger Detection Point (TDP)
TCTDP12	-	Terminating CAMEL TDP Terminating attempt authorized

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

(2) dn is a text string and must use " delimiter in MML command, for example,  
0- "\*21\*678902000#".

## 5.6.2.2 HGCTE Printout

This section lists all HGCTE printouts.

### 5.6.2.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

### 5.6.2.2.2 Answer Printout

This command has no answer printouts.



#### 5.6.2.2.3 Result Printout

This command has no result printouts.

## 5.7 HGCU: Closed User Group

This section covers the following MML HLR commands:

- Home Location Register, Closed User Group, Initiate (HGCUI) (Section 5.7.1 on page 74)
- Home Location Register, Closed User Group, Change (HGCUC) (Section 5.7.2 on page 76)
- Home Location Register, Closed User Group, End (HGCUE) (Section 5.7.3 on page 77)
- Home Location Register, Closed User Group, Print (HGCUP) (Section 5.7.4 on page 78)

### 5.7.1 Home Location Register, Closed User Group, Initiate (HGCUI)

This command initiates a mobile subscriber as a member of a closed user group. Follow the instructions as follows when this command is used:

- The information unit **NI** is optional. When it is not present in the parameter **IC**, a default value, set by an application parameter in the function block **HLCUGA**, are used.
- If the parameter **BSG** is not specified, the closed user group is applied for all applicable basic service groups in which any basic service is subscribed.
- If the parameter **RESTR** is not specified, **NONE** is used as the default value.
- The inter closed user group accessibility and preferential closed user group index are set to **NONE** by default.
- A mobile subscriber can be a member of up to 10 closed user groups.

#### 5.7.1.1 HGCUI Command Description

```
HGCUI:MSISDN=msisdn,INDEX=index,IC=ic[,RESTR=restr][,BSG=bsg...];
```

#### Example of an HGCUI Command

```
HGCUI:MSISDN=345678901234567,INDEX=3,IC=5420,BSG="TS10&TS60";
```

In the example above, the mobile subscriber with MSISDN 345678901234567 is initiated as a member of a closed user group with index 3, default



network identity, and cugcode 5420 for the basic service groups Speech transmission (TS10) and Facsimile (TS60).

#### 5.7.1.1.1 HGCUI Parameters

The following table lists the parameters for the HGCUI command.

*Table 29 HGCUI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
bsg	String <sup>(1)</sup>	The identifier of a basic service group
ic	String in the format: <ni> - <cugcode> <ul style="list-style-type: none"> <li>• &lt;ni&gt; - is optional. If &lt;ni&gt; is not given, the default value is used. Valid values are between 0000-9999.</li> <li>• &lt;cugcode&gt; is the closed user group code. The value belongs to an integer between 0–65535.</li> </ul>	The closed user group interlock code
index	Integer, value range: 0–32,767	The closed user group index
restr	Enumeration value: <ul style="list-style-type: none"> <li>• ICB</li> <li>• OCB</li> <li>• NONE</li> </ul>	The intra closed user group restrictions

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

#### 5.7.1.2 HGCUI Printout

This section lists all HGCUI printouts.

##### 5.7.1.2.1 Check Printout

Yes.

##### 5.7.1.2.2 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

##### 5.7.1.2.3 Answer Printout

This command has no answer printouts.



#### 5.7.1.2.4 Result Printout

This command has no result printouts.

### 5.7.2 Home Location Register, Close User Group, Change (HGCUC)

The command HGCUC changes closed user group data for a mobile subscriber member of a closed user group. This command adds or removes a basic service group to or from the list of basic service groups, to which closed user group index (**INDEX**) either applies or changes the intra closed user group restrictions (**RESTR**), or both.

Follow the instructions as follows when this command is used:

- If an additional and new basic service group for the closed user group mobile subscriber exists, the inter closed user group accessibility and preferential closed user group are set to **NONE** as default value.
- When the parameter **ERASE** is present, the specified basic service group is removed according to the specified closed user group index.

#### 5.7.2.1 HGCUC Command Description

$$\text{HGCUC:MSISDN=msisdn, INDEX=index} \left[ \text{, RESTR=restr} \right] \left[ \text{, BSG=bsg} \left[ \text{, ERASE} \right] \right] +;$$

#### Example of an HGCUC Command

```
HGCUC:MSISDN=345678901234567, INDEX=3, BSG="TS60", ERASE;
```

In the example above, the basic service group **Facsimile** (TS60) is removed from the closed user group with index 3 for the mobile subscriber with MSISDN 345678901234567.

#### 5.7.2.1.1 HGCUC Parameters

*Table 30 HGCUC Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
bsg	String <sup>(1)</sup>	The identifier of a basic service group
index	Integer, value range: 0–32,767	The closed user group index





Parameter	Type	Description
restr	Enumeration value: <ul style="list-style-type: none"> <li>• ICB</li> <li>• OCB</li> <li>• NONE</li> </ul>	The intra closed user group restrictions
ERASE	-	The erase indicator

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

## 5.7.2.2 HGCUC Printout

This section lists all HGCUC printouts.

### 5.7.2.2.1 Check Printout

Yes.

### 5.7.2.2.2 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

### 5.7.2.2.3 Answer Printout

This command has no answer printouts.

### 5.7.2.2.4 Result Printout

This command has no result printouts.

## 5.7.3 Home Location Register, Closed User Group, End (HGCUE)

This command ends a mobile subscriber as a member of one or all closed user groups to which it belongs.

### 5.7.3.1 HGCUE Command Description

$$\text{HGCUE:MSISDN=msisdn, INDEX=}\begin{bmatrix} \text{index} \\ \text{ALL} \end{bmatrix}+;$$

#### Example of an HGCUE Command



```
HGCUE:MSISDN=345678901234567, INDEX=3;
```

In the example above, the mobile subscriber with MSISDN 345678901234567 is ended as a member of the closed user group with index 3.

#### 5.7.3.1.1 HGCUE Parameters

The following table lists the parameters for the HGCUE command.

*Table 31 HGCUE Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
index	One of the following values: <ul style="list-style-type: none"><li>Integer, value range: 0–32,767</li><li>String: ALL</li></ul>	The closed user group index

#### 5.7.3.2 HGCUE Printout

This section lists all HGCUE printouts.

##### 5.7.3.2.1 Check Printout

Yes.

##### 5.7.3.2.2 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 5.7.3.2.3 Answer Printout

This command has no answer printouts.

##### 5.7.3.2.4 Result Printout

This command has no result printouts.

#### 5.7.4 Home Location Register, Closed User Group, Print (HGCUP)

This command initiates the printout of HLR closed user group data. Follow the instructions as follows when this command is used:



- The information unit **NI** is optional. When it is not present in the parameter **IC**, a default value, set by an application parameter in the function block **HCUGA**, are used.
- This command is used to print the existing closed user group data for one or all mobile subscribers.

Deviation:

- This MML command does not support **MSISDN=ALL**.

### 5.7.4.1 HGCUP Command Description

$$\text{HGCUP:MSISDN=msisdn} \left[ \begin{array}{l} \text{, INDEX=index} \\ \text{, IC=ic} \end{array} \right];$$

#### Example of an HGCUP Command

HGCUP:MSISDN=345678901234567, INDEX=3;

In the example above, the closed user group data for the mobile subscriber 345678901234567, the member of the closed user group with Index 3, are printed.

#### 5.7.4.1.1 HGCUP Parameters

The following table lists the parameters for the HGCUP command.

*Table 32 HGCUP Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
index	Integer, value range: 0–32,767	The closed user group index
ic	String in the format: <ni> - <cugcode> <ul style="list-style-type: none"> <li>• &lt;ni&gt; - is optional. If &lt;ni&gt; is not given, the default value is used.</li> <li>• &lt;cugcode&gt; is the closed user group code. The value belongs to an integer between 0–65,535.</li> </ul>	The closed user group interlock code

### 5.7.4.2 HGCUP Printout

This section lists all HGCUP printouts.

#### 5.7.4.2.1 Procedure Printout

NOT ACCEPTED  
fault type

5.7.4.2.2      Answer Printout

The printout of HLR closed user group data is shown as follows:

[illegible]

The following table contains information about the parameters in the HGCUP answer printout:

Table 33 HGCUP Answer Printout Parameters

Parameter	Type	Description
bsg	String <sup>(1)</sup>	The identifier of a basic service group
ic	String in the format: <ni> - <cugcode> <ul style="list-style-type: none"> <li>• &lt;ni&gt; - is optional. If &lt;ni&gt; is not given, the default value is used.</li> <li>• &lt;cugcode&gt; is the closed user group code. The value belongs to an integer between 0–65,535.</li> </ul>	The closed user group interlock code
index	Integer, value range: 0–32,767	The closed user group index
restr	Enumeration value: <ul style="list-style-type: none"> <li>• ICB</li> <li>• OCB</li> <li>• NONE</li> </ul>	The intra closed user group restrictions
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number

(1) For more information, see *HLR Subscriber Data Type Definitions*, Reference [6].



#### 5.7.4.2.3 Result Printout

This command has no result printouts.

## 5.8 HGIC: IMSI Changeover

This section covers the following MML HLR commands:

- Home Location Register, IMSI Changeover, Initiate (HGICI) (Section 5.8.1 on page 81)
- Home Location Register, IMSI Changeover, Change (HGICC) (Section 5.8.2 on page 83)
- Home Location Register, IMSI Changeover, End (HGICE) (Section 5.8.3 on page 84)
- Home Location Register, IMSI Changeover, Print (HGICP) (Section 5.8.4 on page 85)

These operations support AUC, HLR, IMS and EPS services.

**Note:** IMS is only supported by immediate IMSI Changeover procedure.

In layered data architecture, IMSI changeover procedure affects all services provisioned for this subscriber. If the subscriber has services other than AUC, HLR or EPS, execute IMSI changeover according to *Layered Identity Changeover Provisioning over CAI3G*, Reference [9].

### 5.8.1 Home Location Register, IMSI Changeover, Initiate (HGICI)

This command can initiate an IMSI changeover procedure in the HLR in the following two ways:

- This command can enforce the immediate execution if the parameter `DATE` is not specified or set to today's date. The subscriber location is set to unknown status.
- If the expiry date, defined in parameter `DATE`, is specified and is not today's date, the mobile subscriber can use the old Subscriber Identity Module (SIM) / Universal Subscriber Identity Module (USIM) card until the predefined date is reached or the new card is used for first time.

If the subscription is MSISDN-less, it is not allowed to execute IMSI Changeover.

This command is always capable of being executed, even if a previous HGICI has failed.



### 5.8.1.1 HGICI Command Description

$$\text{HGICI:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right] +, \text{NIMSI=nimsi [, DATE=date] ;}$$

#### Example of an HGICI Command

```
HGICI:MSISDN=345678901234567,NIMSI=123456789011111,DATE=111111;
```

In the example above, the change to the new IMSI 123456789011111 is initiated for the mobile subscriber with MSISDN 345678901234567, the expiry date of which is set as 11 November 2011.

#### 5.8.1.1.1 HGICI Parameters

The following table lists the parameters for the HGICI command.

*Table 34 HGICI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
nimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	New IMSI
date	Digit, format: yymmdd <ul style="list-style-type: none"><li>yy: year, value range: 00–99</li><li>mm: month, value range 01–12</li><li>dd: day, value range: 01–31</li></ul>	The activation date for the new IMSI The date is not to earlier than today and not later than a year from today's date.

### 5.8.1.2 HGICI Printout

This section lists all HGICI printouts.

#### 5.8.1.2.1 Check Printout

Yes.

#### 5.8.1.2.2 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type



#### 5.8.1.2.3 Answer Printout

This command has no answer printouts.

#### 5.8.1.2.4 Result Printout

This command has no result printouts.

### 5.8.2 Home Location Register, IMSI Changeover, Change (HGICC)

This command changes the expiry date of the IMSI changeover either by defining a new date, or enforcing an immediate execution for the new IMSI if the parameter `DATE` is not specified or set to today. The command is accepted only for a pending changeover.

#### 5.8.2.1 HGICC Command Description

$$\text{HGICC:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{NIMSI=nimsi} \end{array} \right] + [ , \text{DATE=date} ] ;$$

#### Example of an HGICC Command

```
HGICC:MSISDN=345678901234567,DATE=111112;
```

In the example above, the change of the expiry date, 12 November 2011, is entered for the mobile subscriber with MSISDN 345678901234567.

#### 5.8.2.1.1 HGICC Parameters

The following table lists the parameters for the HGICC command.

*Table 35 HGICC Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
nimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	New IMSI
date	Digit, format: yymmdd <ul style="list-style-type: none"> <li>yy: year, value range: 00–99</li> <li>mm: month, value range 01–12</li> <li>dd: day, value range: 01–31</li> </ul>	The activation date for the new IMSI The date is not to be earlier than today and not later than a year from today's date.



### 5.8.2.2 HGICC Printout

This section lists all HGICC printouts.

#### 5.8.2.2.1 Check Printout

Yes.

#### 5.8.2.2.2 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.8.2.2.3 Answer Printout

This command has no answer printouts.

#### 5.8.2.2.4 Result Printout

This command has no result printouts.

### 5.8.3 Home Location Register, IMSI Changeover, End (HGICE)

This operation can be used when a delayed IMSI changeover has been ordered but date has not yet passed (IMSI changeover has not been executed). The result is that the old IMSI is kept for the subscriber. The new IMSI is released to be used again or deleted.

This command is always capable of being executed, even if a previous HGICE has failed.

#### 5.8.3.1 HGICE Command Description

$$\text{HGICE:} + \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{NIMSI=nimsi} \end{array} \right] + ;$$

#### Example of an HGICE Command

```
HGICE:MSISDN=345678901234567;
```

In the example above, the data related to the new IMSI for the mobile subscriber with MSISDN 345678901234567 is deleted.





#### 5.8.3.1.1 HGICE Parameters

The following table lists the parameters for the HGICE command.

*Table 36 HGICE Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
nimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	New IMSI

#### 5.8.3.2 HGICE Printout

This section lists all HGICE printouts.

##### 5.8.3.2.1 Check Printout

Yes.

##### 5.8.3.2.2 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

##### 5.8.3.2.3 Answer Printout

This command has no answer printouts.

##### 5.8.3.2.4 Result Printout

This command has no result printouts.

#### 5.8.4 Home Location Register, IMSI Changeover, Print (HGICP)

This command initiates the HLR IMSI changeover data printout. The changeover data of one mobile subscriber with ongoing changeover procedure can be printed.

Deviations:

- The parameters `PEND`, `EXEC`, and `FORCED` are not supported.
- Only the individual version of command is supported. The command containing `NIMSI=ALL` is not supported.



### 5.8.4.1 HGICP Command Description

$$\text{HGICP:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{NIMSI=nimsi} \end{array} \right];$$

#### Example of an HGICP Command

```
HGICP:MSISDN=345678901234567;
```

In the example above, the changeover data for the mobile subscriber with MSISDN 345678901234567 are printed.

#### 5.8.4.1.1 HGICP Parameters

The following table lists the parameters for the HGICP command.

*Table 37 HGICP Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
nimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	New IMSI

### 5.8.4.2 HGICP Printout

This section lists all HGICP printouts.

#### 5.8.4.2.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

#### 5.8.4.2.2 Answer Printout

```
HLR IMSI CHANGEOVER DATA

MSISDN    IMSI    NIMSI    STATE    DATE    [ AUTHD ]
msisdn    imsi    nimsi    state    date    [ authd ]

[NONE]

END
```

The following table lists information about the parameters in the HGICP answer printout.



**Table 38** *HGICP Answer Printout Parameters*

Parameter	Type	Description
authd	Enumerate value: <ul style="list-style-type: none"> <li>• AVAIL: Authentication data available</li> <li>• NOIMSI: No IMSI in the AUC during the last attempt to get authentication data for this mobile subscriber</li> <li>• NOACC: No access to the AUC during the last attempt to get authentication data for this mobile subscriber</li> </ul>	The available authentication data
date	Digit, format: yymmdd <ul style="list-style-type: none"> <li>• yy: year, value range: 00–99</li> <li>• mm: month, value range 01–12</li> <li>• dd: day, value range: 01–31</li> </ul>	The expiry date or the date for the execution of the changeover procedure
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
nimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	New IMSI
state	<sup>(1)</sup>	The changeover status
NONE	-	This parameter indicates that no data is printed.

(1) For information about the different states possible to receive, see *Function Specification Identity Changeover for Layered Applications*, Reference [8]

#### 5.8.4.2.3 Result Printout

This command has no result printouts.

## 5.9 HGIR: IMSI Changeover Removal

This section covers the following MML HLR command:

- Home Location Register, IMSI Changeover Removal, Initiate (HGIRI) (Section 5.9.1 on page 87)

In layered data architecture, IMSI changeover procedure affects all services provisioned for this subscriber. If the subscriber has services other than AUC, HLR or EPS, execute IMSI changeover according to *Layered Identity Changeover Provisioning over CAI3G*, Reference [9].



## 5.9.1 Home Location Register, IMSI Changeover Removal, Initiate (HGIRI)

This command initiates the removal of all references to the old IMSI, if the new IMSI has been taken into operation for all services.

This command is always capable of being executed, even if a previous HGIRI has failed.

### 5.9.1.1 HGIRI Command Description

$$\text{HGIRI:} + \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right] ;$$

#### Example of an HGIRI Command

```
HGIRI:MSISDN=45678901234567;
```

In the example above, all references to the old IMSI for the mobile subscriber with MSISDN 345678901234567 are deleted.

#### 5.9.1.1.1 HGIRI Parameters

The following table lists the parameters for the HGIRI command.

*Table 39 HGIRI Parameters*

Parameter	Type	Description
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number

### 5.9.1.2 HGIRI Printout

This section lists all HGIRI printouts.

#### 5.9.1.2.1 Check Printout

Yes.

#### 5.9.1.2.2 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED  
fault type
```



#### 5.9.1.2.3 Answer Printout

This command has no answer printouts.

#### 5.9.1.2.4 Result Printout

This command has no result printouts.

## 5.10 HGLD: HLR Subscriber Location Services Data

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Location Services Data, Initiate (HGLDI) (Section 5.10.1 on page 89)
- Home Location Register, Subscriber Location Services Data, Change (HGLDC) (Section 5.10.2 on page 91)
- Home Location Register, Subscriber Location Services Data, End (HGLDE) (Section 5.10.3 on page 93)
- Home Location Register, Subscriber Location Services Data, Print (HGLDP) (Section 5.10.4 on page 95)

### 5.10.1 Home Location Register, Subscriber Location Services Data, Initiate (HGLDI)

This command initiates the following services: Location Services (LCS) classes or service types for a mobile subscriber in the HLR. It also initiates external addresses for already initiated call or session unrelated privacy class, or call or session-related privacy class.

- Location Services (LCS) classes or service types for a mobile subscriber in the HLR
- External addresses for the already initiated call or session-related privacy class
- External addresses for the already initiated call or session unrelated privacy class

Follow the instructions as follows when this command is used:

- If the parameter `EADD` is entered, one external address is added either for call or session unrelated LCS privacy class (`CUNRL`), or call or session-related LCS privacy class (`CREL`).
- If the parameter `EADD` is entered and both optional parameters `CREL` and `CUNRL` are omitted, then the external address is added to call or session unrelated LCS privacy class.



- Up to 40 external addresses can be defined for call or session unrelated LCS privacy class.
- Up to 40 external addresses can be defined for call or session-related LCS privacy class.
- Up to 32 service types can be defined for a mobile subscriber.
- If the parameter `NOTF` is not entered, the default value is assigned.
- If the parameter `INTID` is entered, the internal identities entered are added for PLMN operators LCS privacy class.
- If the parameter `GRES` is not entered, no restriction on the Gateway Mobile Location Center (GMLC) is assigned.

#### 5.10.1.1

#### HGLDI Command Description

$$\text{HGLDI:MSISDN=msisdn,+MOCL=mocl...} \left[ \begin{array}{l} \text{UNIV} \\ \text{CREL[,NOTF=notf]} \\ \text{CUNRL[,NOTF=notf]} \\ \text{PLMNO[,INTID=intid...]} \\ \text{SERVT=servt...[,GRES=gres][,NOTF=notf]} \\ \text{EADD=eadd[,GRES=gres][,NOTF=notf]} \left[ \begin{array}{l} \left[ \begin{array}{l} \text{CREL} \\ \text{CUNRL} \end{array} \right] \\ + \\ \left[ \begin{array}{l} \text{CREL} \\ \text{CUNRL} \end{array} \right] \end{array} \right] \end{array} \right] +;$$

#### Example of an HGLDI Command

`HGLDI:MSISDN=345678901234567,EADD=666999,GRES=0,NOTF=1,CREL;`

In the example above, the external address 666999 with location request allowed from identified GMLCs and notification for the mobile subscriber with MSISDN 345678901234567 is initiated for call or session-related LCS privacy class.

#### 5.10.1.2

#### HGLDI Parameters

The following table lists the parameters for the HGLDI command.

**Table 40 HGLDI Parameters**

Parameter	Type	Description
CREL	-	The call or session-related LCS privacy class
CUNRL	-	The call or session unrelated LCS privacy class
eadd	Digit string, 3–15 digits (value range for each digit: 0–9)	The external address
gres	One of the following values: <ul style="list-style-type: none"> <li>0: only GMLCs defined in the subscribers GMLC address list</li> <li>1: any GMLC in the home country</li> </ul>	The restriction on the GMLC
intid	Integer, value range: 0–4	The internal identity
mocl	Enumeration value: <ul style="list-style-type: none"> <li>ASL</li> <li>BSL</li> <li>TTP</li> </ul>	The LCS mobile originating class
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
notf	Integer, value range: 0–4	The location request restriction related to the notification to the mobile subscriber
PLMNO	-	The PLMN operators LCS privacy class
servt	Integer, value range: 0–20 and 64–127	The service types
UNIV	-	The universal LCS privacy class

### 5.10.1.3 HGLDI Printout

This section lists all HGLDI printouts.

#### 5.10.1.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.10.1.3.2 Answer Printout

This command has no answer printouts.

#### 5.10.1.3.3 Result Printout

This command has no result printouts.



## 5.10.2 Home Location Register, Subscriber Location Services Data, Change (HGLDC)

This command changes the LCS privacy class data or service type data for a mobile subscriber in the HLR. It also changes data related to an external address, the optional parameter CREL, or CUNRL of which can be used to specify the LCS privacy class (call or session related, or call or session unrelated) for which the change is applicable. If neither of these parameters are given, the specified external address is changed for call or session unrelated LCS privacy class.

### 5.10.2.1 HGLDC Command Description

$$\text{HGLDC:MSISDN=msisdn, +} \left[ \begin{array}{l} \text{CREL, NOTF=notf} \\ \text{CUNRL, NOTF=notf} \\ \text{EADD=eadd, +} \left[ \begin{array}{l} \text{GRES=gres} \\ \text{NOTF=notf} \end{array} \right] \left[ \begin{array}{l} \text{CREL} \\ \text{CUNRL} \end{array} \right] \\ \text{SERVT=servt, +} \left[ \begin{array}{l} \text{GRES=gres} \\ \text{NOTF=notf} \end{array} \right] \end{array} \right] + ;$$

### Example of an HGLDC Command

```
HGLDC:MSISDN=345678901234567,EADD=9988776655,NOTF=2,CREL;
```

In the example above, the location request restriction for the call or session-related external address 9988776655 for the subscriber with MSISDN 345678901234567 is changed to location request with notification and privacy verification allowed in case of no response.

### 5.10.2.2 HGLDC Parameters

The following table lists the parameters for the HGLDC command.

Table 41 HGLDC Parameters

Parameter	Type	Description
CREL	-	The call or session-related LCS privacy class
CUNRL	-	The call or session unrelated LCS privacy class
eadd	Digit string, 3–15 digits (value range for each digit: 0–9)	The external address





Parameter	Type	Description
gres	One of the following values: <ul style="list-style-type: none"> <li>0: only GMLCs defined in the subscribers GMLC address list</li> <li>1: any GMLC in the home country</li> </ul>	The restriction on the GMLC
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
notf	Integer, value range: 0–4	The location request restriction related to the notification to the mobile subscriber
servt	Integer, value range: 0–20 and 64–127	The service type

### 5.10.2.3 HGLDC Printout

This section lists all HGLDC printouts.

#### 5.10.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.10.2.3.2 Answer Printout

This command has no answer printouts.

#### 5.10.2.3.3 Result Printout

This command has no result printouts.

### 5.10.3 Home Location Register, Subscriber Location Services Data, End (HGLDE)

This command ends the LCS classes or service types for a subscriber in the HLR. It also ends LCS class data corresponding to an LCS class already defined or service type data corresponding to a service type already defined. If all optional parameters are not entered, all LCS data for a mobile subscriber are ended.



### 5.10.3.1 HGLDE Command Description

```
HGLDE:MSISDN=msisdn, +PLMNO[, INTID=intid...] +  
[  
    UNIV  
    CREL[, EADD=eadd[, GRES]]  
    CUNRL[, EADD=eadd[, GRES]]  
    ALLPCL  
    MOCL= mocl...  
    SERV+=+  
        [servt[, GRES]]  
        [ALL]  
]
```

#### Example of an HGLDE Command

```
HGLDE:MSISDN=345678901234567, CREL, EADD=32453435, GRES;
```

In the example above, the GMLC restriction of the external address 32453435 for the call or session-related LCS privacy class for the mobile subscriber with MSISDN 345678901234567 is ended.

### 5.10.3.2 HGLDE Parameters

The following table lists the parameters for the HGLDE command.

*Table 42 HGLDE Parameters*

Parameter	Type	Description
ALLPCL	-	The LCS privacy classes
CREL	-	The call or session-related LCS privacy class
CUNRL	-	The call or session unrelated LCS privacy class
eadd	Digit string, 3–15 digits (value range for each digit: 0–9)	The external address
GRES	-	The restriction on the GMLC
intid	One of the following values: <ul style="list-style-type: none"><li>Integer, value range: 0–4</li><li>String, ALL</li></ul>	The internal identity



Parameter	Type	Description
mocl	Enumeration value: <ul style="list-style-type: none"> <li>• ASL</li> <li>• BSL</li> <li>• TTP</li> </ul>	The LCS mobile originating class
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
PLMNO	-	The PLMN operators LCS privacy class
servt	Integer, value range: 0–20 and 64–127	The service type
UNIV	-	The universal LCS privacy class

### 5.10.3.3 HGLDE Printout

This section lists all HGLDE printouts.

#### 5.10.3.3.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

#### 5.10.3.3.2 Answer Printout

This command has no answer printouts.

#### 5.10.3.3.3 Result Printout

This command has no result printouts.

## 5.10.4 Home Location Register, Subscriber Location Services Data, Print (HGLDP)

This command prints the LCS data for mobile subscribers in the HLR.

The printout of result for HLR subscriber location services data is received.

Deviations

- MSISDN can only accept individual value, not multiple ones.

### 5.10.4.1 HGLDP Command Description

HGLDP:MSISDNS=msisdns;



### Example of an HGLDP Command

```
HGLDP:MSISDNS=345678901234567;
```

In the example above, the LCS data for the mobile subscriber with MSISDN 345678901234567 are printed.

#### 5.10.4.2 HGLDP Parameters

The following table lists the parameter for the HGLDP command.

*Table 43 HGLDP Parameter*

Parameter	Type	Description
msisdns	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series

#### 5.10.4.3 HGLDP Printout

This section lists all HGLDP printouts.

##### 5.10.4.3.1 Procedure Printout

```
[ ORDERED  
+  
NOT ACCEPTED  
fault type  
+ ]
```

##### 5.10.4.3.2 Answer Printout

This command has no answer printouts.

##### 5.10.4.3.3 Result Printout

The result printout of HLR subscriber location services data is shown as follows:



```

HLR SUBSCRIBER LOCATION SERVICES DATA

MSISDN
msisdn

[
  PRIVACY LCS CLASS DATA
  LCSCl  NOTf  INTID  EADD                GRES  NOTf
  [UNIV]
  [
    CREL    notf          [eadd          [gres] notf]
                        .
                        .
                        .
                        eadd          [gres] notf
  ]
  [
    CUNRL    notf          [eadd          [gres] notf]
                        .
                        .
                        .
                        eadd          [gres] notf
  ]
  [
    PLMNO          [intid]
                  .
                  .
                  .
                  intid
  ]
  [NO PRIVACY LCS CLASS DEFINED]
  [
    PRIVACY SERVICE TYPE DATA
    SERVt  GRES  NOTf
    servt [gres] notf
    .
    .
    .
    .
    servt [gres] notf
  ]
]

[
  MOBILE ORIGINATING LCS CLASS
  MOCL
  mocl
  .
  .
  .
  mocl
]

[NONE]

END

```

**Table 44** HGLDP Answer Printout Parameters

Parameter	Type	Description
CREL	-	The LCS privacy classes
CUNRL	-	The call or session-related LCS privacy class
eadd	Digit string, 3–15 digits (value range for each digit: 0–9)	The external address



Parameter	Type	Description
gres	One of the following values: <ul style="list-style-type: none"><li>• 0: only GMLCs defined in the subscribers GMLC address list</li><li>• 1: any GMLC in the home country</li></ul>	The restriction on the GMLC
intid	Integer, value range: 0–4	The internal identity
mocl	Enumeration value: <ul style="list-style-type: none"><li>• ASL</li><li>• BSL</li><li>• TTP</li></ul>	The LCS mobile originating class
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
notf	Integer, value range: 0–4	The location request restriction related to the notification to the mobile subscriber
PLMNO	-	The PLMN operators LCS privacy class
servt	Integer, value range: 0–20 and 64–127	The service type
UNIV	-	The universal LCS privacy class
NO PRIVACY LCS CLASS DEFINED	-	There is no LCS privacy class defined for the mobile subscriber.

## 5.11 HGMW: Subscriber Message Waiting Data List

This section covers the following MML HLR command:

- Home Location Register, Subscriber Message Waiting Data List, Print (HGMWP) (Section 5.11.1 on page 98)

### 5.11.1 Home Location Register, Subscriber Message Waiting Data List, Print (HGMWP)

This command initiates a printout of all Service Center (SC) addresses stored in the message waiting data list for the given subscriber.

The data are included in the printout of HLR subscriber message waiting data list.

#### 5.11.1.1 HGMWP Command Description

$$\text{HGMWP:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right];$$



### Example of an HGMWP Command

```
HGMWP:IMSI=123456789012345;
```

In the example above, all SC addresses, contained in the `MessageWaitingData` list corresponding to the subscriber with IMSI 123456789012345, are printed.

#### 5.11.1.2 HGMWP Parameters

The following table lists the parameters for the HGMWP command.

*Table 45 HGMWP Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity

#### 5.11.1.3 HGMWP Printout

This section lists all HGMWP printouts.

##### 5.11.1.3.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

##### 5.11.1.3.2 Answer Printout

The following is the printout of the HLR subscriber message waiting data list:

```
HLR SUBSCRIBER MESSAGE WAITING DATA LIST

MSISDN      IMSI      MCE   MNRF   [ MNRG ]
msisdn      imsi      mce   [mnrf] [mnrgr]

SCADD
scadd
.
.
.
scadd
[NONE]

END
```

The following table contains information about the parameters in the HGMWP answer printout.

**Table 46** *HGMWP Answer Printout Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
mce	Enumeration value: <ul style="list-style-type: none"><li>• NO</li><li>• YES</li></ul>	This parameter indicates that the mobile station memory capacity is exceeded.
mnrf	Enumeration value: <ul style="list-style-type: none"><li>• REACH</li><li>• NREACH</li></ul>	This parameter indicates that the mobile station is not reachable through the MSC.
mnrg	Enumeration value: <ul style="list-style-type: none"><li>• REACH</li><li>• NREACH</li></ul>	This parameter indicates that the mobile station is not reachable through SGSN. This is an application system-dependent parameter.
scadd	Expressed as na-ai: <ul style="list-style-type: none"><li>• na: the nature of the address indicator (3-national, 4-international)</li><li>• ai: address information</li></ul>	The SC address

#### 5.11.1.3.3

#### Result Printout

This command has no result printouts.

## 5.12

## HGMS: Multiple Subscription

This section covers the following MML HLR commands:

- Home Location Register, Multiple Subscription, Initiate (HGMSI) (Section 5.12.1 on page 100)
- Home Location Register, Multiple Subscription, Change (HGMSC) (Section 5.12.2 on page 102)
- Home Location Register, Multiple Subscription, End (HGMSE) (Section 5.12.3 on page 104)
- Home Location Register, Multiple Subscription, Print (HGMSPP) (Section 5.12.4 on page 105)





## 5.12.1 Home Location Register, Multiple Subscription, Initiate (HGMSI)

This command initiates multiple subscription data in the HLR linking one subscription identified by the parameter `IMSI` to the master subscription identified by the parameter `MSISDN`.

Deviations:

- This MML command only supports one `IMSI`.
- `ZONEID` is added as the optional parameter for the support for geographical areas.

### 5.12.1.1 HGMSI Command Description

```
HGMSI:MSISDN=msisdn,IMSI=imsi,MCH=mch[,ZONEID=zoneid];
```

#### Example of an HGMSI Command

```
HGMSI:MSISDN=345678901234567,IMSI=1234567890123,MCH="LOC";
```

In the previous example, multiple subscription data are initiated with master subscription identified by `MSISDN 345678901234567`. The subscription with `IMSI 1234567890123` is linked to the multiple subscriptions. The location updating procedure is the multiple subscription activation mechanism.

#### 5.12.1.1.1 HGMSI Parameters

The following table lists the parameters for the HGMSI command.

*Table 47 HGMSI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
mch	Enumeration value: <ul style="list-style-type: none"> <li>• LOC</li> <li>• USSD</li> </ul>	The multiple subscription activation mechanism: <ul style="list-style-type: none"> <li>• Location updating mechanism (LOC)</li> <li>• Subscriber procedure based on Unstructured Supplementary Service Data (USSD)</li> </ul>
zoneid	Integer 0-65535	This parameter indicates the geographical area to which the MultiSC or the association belongs.

### 5.12.1.2 HGMSI Printout

This section lists all HGMSI printouts.



#### 5.12.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.12.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.12.1.2.3 Result Printout

This command has no result printouts.

### 5.12.2 Home Location Register, Multiple Subscription, Change (HGMSC)

This command changes multiple subscription data in the HLR identified by the parameter `MSISDN`.

The following data are changed in the multiple subscription:

- When the parameter `IMSI` is entered and the parameter `ERASE` is not entered, subscriptions are linked to the multiple subscription.
- When the parameter `IMSI` and `ERASE` are entered, subscriptions are unlinked from multiple subscription.
- When the parameter `MCH` is entered, the activation mechanism in the multiple subscription is changed.
- When the parameter `ACIMSI` is entered and the multi-subscription activation mechanism is the subscriber procedure based on USSD, the active subscription in the multiple subscription is changed.
- When the parameter `MMSISDN` is entered, the master subscription in the multiple subscription is changed.

Deviation:

- This MML command only supports one `IMSI`.

The `link` version of this command is fault tolerant in the sense that it is always possible to execute even if a previous `HGMSC`, without `ERASE`, has failed.

The `unlink` version of this command is fault tolerant in the sense that it is always possible to execute, even if a previous `HGMSC`, with or without `ERASE`, has failed.



### 5.12.2.1 HGMSC Command Description

```
HGMSC:MSISDN=msisdn,
[
  IMSI=imsi[,ERASE]
  MCH=mch
  ACIMSI=acimsi
  MMSISDN=mmsisdn
];
```

#### Example of an HGMSC Command

```
HGMSC:MSISDN=345678901234567,IMSI=32109876,ERASE;
```

In the example above, the subscription with IMSI 32109876 is separated from the multiple subscription with master subscription identified by MSISDN 345678901234567.

### 5.12.2.1.1 HGMSC Parameters

The following table lists the parameters for the HGMSC command.

**Table 48** HGMSC Parameters

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
ERASE	-	This parameter indicates whether the subscription is to be linked to or separated from the multiple subscription.
acimsi	Digit string, 6–15 digits (value range for each digit: 0–9)	The active subscription in the multiple subscription
mmsisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	The master subscription in the multiple subscription
mch	Enumeration value: <ul style="list-style-type: none"> <li>• LOC</li> <li>• USSD</li> </ul>	The multiple subscription activation mechanism

### 5.12.2.2 HGMSC Printout

This section lists all HGMSC printouts.

#### 5.12.2.2.1 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED
fault type
```



#### 5.12.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.12.2.2.3 Result Printout

This command has no result printouts.

### 5.12.3 Home Location Register, Multiple Subscription, End (HGMSE)

This command ends multiple subscription data in the HLR. All subscriptions linked to the master subscription identified by the parameter `MSISDN` are separated.

The `HGMSE` command is fault tolerant in the sense that it is always possible to execute, even if a previous `HGMSI` or `HGMSE` has failed.

Deviations:

- The command only support multiple subscriptions with two linked subscriptions. If the multiple subscription has more than two linked subscriptions, the linked subscriptions must be unlinked before this command can be used.

#### 5.12.3.1 HGMSE Command Description

```
HGMSE:MSISDN=msisdn;
```

##### Example of an HGMSE Command

```
HGMSE:MSISDN=345678901234567;
```

In the example above, multiple subscription data with the master subscription identified by the parameter `MSISDN 345678901234567` is ended. All subscriptions linked to the master subscription are separated.

##### 5.12.3.1.1 HGMSE Parameter

The following table lists the parameter for the `HGMSE` command.

*Table 49 HGMSE Parameter*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number



### 5.12.3.2 HGMSE Printout

This section lists all HGMSE printouts.

#### 5.12.3.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.12.3.2.2 Answer Printout

This command has no answer printouts.

#### 5.12.3.2.3 Result Printout

This command has no result printouts.

### 5.12.4 Home Location Register, Multiple Subscription, Print (HGMSP)

This command prints multiple subscription data for a subscription in the HLR.

Deviations:

- This MML command cannot accept MSISDN series. All values are considered as the individual numbers.
- ZONEID is added to the printout description as the optional parameter for the support for geographical areas.
- Only one subscriber can be printed in the printout.

#### 5.12.4.1 HGMSP Command Description

```
HGMSP:MSISDNS=msisdns;
```

##### Example of an HGMSP Command

```
HGMSP:MSISDNS=345678901234567;
```

In the example, multiple subscription data for all subscriptions with MSISDN 345678901234567 are printed.

##### 5.12.4.1.1 HGMSP Parameters

The following table lists the parameter for the HGMSP command.

*Table 50 HGMSP Parameter*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series

#### 5.12.4.2 HGMSP Printout

This section lists all HGMSP printouts.

##### 5.12.4.2.1 Procedure Printout

```
[ORDERED
+NOT ACCEPTED
fault type
+]
```

##### 5.12.4.2.2 Answer Printout

This command has no answer printouts.

##### 5.12.4.2.3 Result Printout

```
HLR MULTIPLE SUBSCRIPTION DATA

MSISDN      IMSI      ACTIVE  MCH  [ZONEID]
msisdn      imsi      active  mch  [zoneid]
.
.
.
        imsi      active

[NONE]

END
```

The following table lists information about the parameters in the HGMSP result printout.

*Table 51 HGMSP Result Printout Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
active	Enumeration value: <ul style="list-style-type: none"><li>• YES: subscription active</li><li>• NO: subscription not active</li></ul>	The active subscription indicator



Parameter	Type	Description
mch	Enumeration value: <ul style="list-style-type: none"> <li>• LOC</li> <li>• USSD</li> </ul>	The multiple subscription activation mechanism
zoneid	Integer 0-65535	This parameter indicates the geographical area to which the MultiSC or the association belongs. This is an optional parameter.

## 5.13 HGPDP: Subscriber PDP Context

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Packet Data Protocol Context, Initiate (HGPDI) (Section 5.13.1 on page 107)
- Home Location Register, Subscriber Packet Data Protocol Context, Change (HGPDC) (Section 5.13.2 on page 109)
- Home Location Register, Subscriber Packet Data Protocol Context, End (HGPDE) (Section 5.13.3 on page 113)
- Home Location Register, Subscriber Packet Data Protocol Context, Print (HGPDP) (Section 5.13.4 on page 114)

### 5.13.1

#### Home Location Register, Subscriber Packet Data Protocol Context, Initiate (HGPDI)

This command defines a subscriber PDP context for a mobile subscriber in the HLR. Up to 50 PDP contexts can be defined per subscriber.

Follow the instructions as follows when this command is used:

- If the parameter `APNID` is not entered, a subscriber PDP context is defined to allow the mobile subscriber to request a non-subscribed APN. Only one subscriber PDP context with a non-subscribed APN can be defined per PDP context type for the same subscriber.
- The parameter `PDPADD` must be entered if the subscriber PDP context is used for static addressing. It must not be entered if the subscriber PDP context is used for dynamic addressing.

**Note:** If the parameter `PDPADD` is entered with an IP version 6 address, it is allowed to use “::” to indicate a group of zeros. “::” can only appear once in one address.

- If the parameter `PDPTY` is not entered, the type associated with the subscriber PDP context is IP version 4 (IPv4). When the `PDPTY` is specified as Point-to-Point Protocol (PPP), dynamic addressing must be used.



- If the parameter `PDPCH` is entered with no PDP context charging characteristics profile GPRS support node behavior value, the default value is assigned.
- If the parameter `VPAA` is not entered, the mobile subscriber is not allowed to use the APN in the domain of the Visited Public Land Mobile Network (VPLMN).
- If the parameter `PDPID` is entered, the identifier is associated with the subscriber PDP context. If it is not entered, the first unused identifier is associated.
- If a subscriber PDP context is already defined for a mobile subscriber, it cannot be defined for static addressing with the same values in the parameters `APNID`, `PDPADD`, and `PDPTY`.
- If a subscriber PDP context is already defined for a mobile subscriber, it cannot be defined for dynamic addressing with the same values in the parameters `APNID` and `PDPTY`.
- If a subscriber PDP context is defined with an IPv4 or IP version 6 (IPv6) address, the value of the parameter `PDPTY` also needs to be the same type.

### 5.13.1.1

#### HGPDI Command Description

```
HGPDI: +[MSISDN=msisdn] +,EQOSID=eqosid[,APNID=apnid]
        [IMSI=imsi]
        [,PDPADD=pdpadd][,PDPTY=pdpty][,PDPCH=dpch][,VPAA][,PDPID=dpid];
```

#### Example of an HGPDI Command

```
HGPDI:MSISDN=345678901234567,EQOSID=3,APNID=1200,PDPADD="5.120.212.40",VPAA,PDPID=1;
```

In the example above, a subscriber PDP context with APN identifier 1200, specific Quality of Service (QoS) and PDP address 5.120.212.40 for a mobile subscriber with MSISDN 12345678 is defined. The mobile subscriber is allowed to use the APN and the VPLMN.

#### 5.13.1.1.1

#### HGPDI Parameters

The following table lists the parameters for the HGPDI command.

*Table 52 HGPDI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity





Parameter	Type	Description
eqosid	Decimal, value range:0–4,095.	The extended QoS identifier
apnid	Integer, value range: 0–16,383	The APN identifier
pdpadd	One of the following types: <ul style="list-style-type: none"> <li>IPv4</li> <li>IPv6</li> </ul>	The PDP address
pdppty	One of the following types: <ul style="list-style-type: none"> <li>IPv4</li> <li>IPv6</li> <li>PPP</li> </ul> The default value is IPv4.	This parameter indicates the PDP context type.
pdpch	Expressed as <code>pdp<i>pi</i> [-pdp<i>gb</i>]</code> : <ul style="list-style-type: none"> <li><code>pdp<i>pi</i></code>: this indicates a PDP context charging characteristics profile index (Integer, value range: 0-15).</li> <li><code>pdp<i>gb</i></code> this indicates a PDP context charging characteristics profile GPRS support node behavior index (integer, value range:0-4095). The default value is 0.</li> </ul>	The PDP context charging characteristics
VPAA	-	The VPLMN address is allowed.
pdpid	Integer, value range: 1-50	The PDP context identifier

### 5.13.1.2 HGPDI Printout

This section lists all HGPDI printouts.

#### 5.13.1.2.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

#### 5.13.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.13.1.2.3 Result Printout

This command has no result printouts.

### 5.13.2 Home Location Register, Subscriber Packet Data Protocol Context, Change (HGPDC)

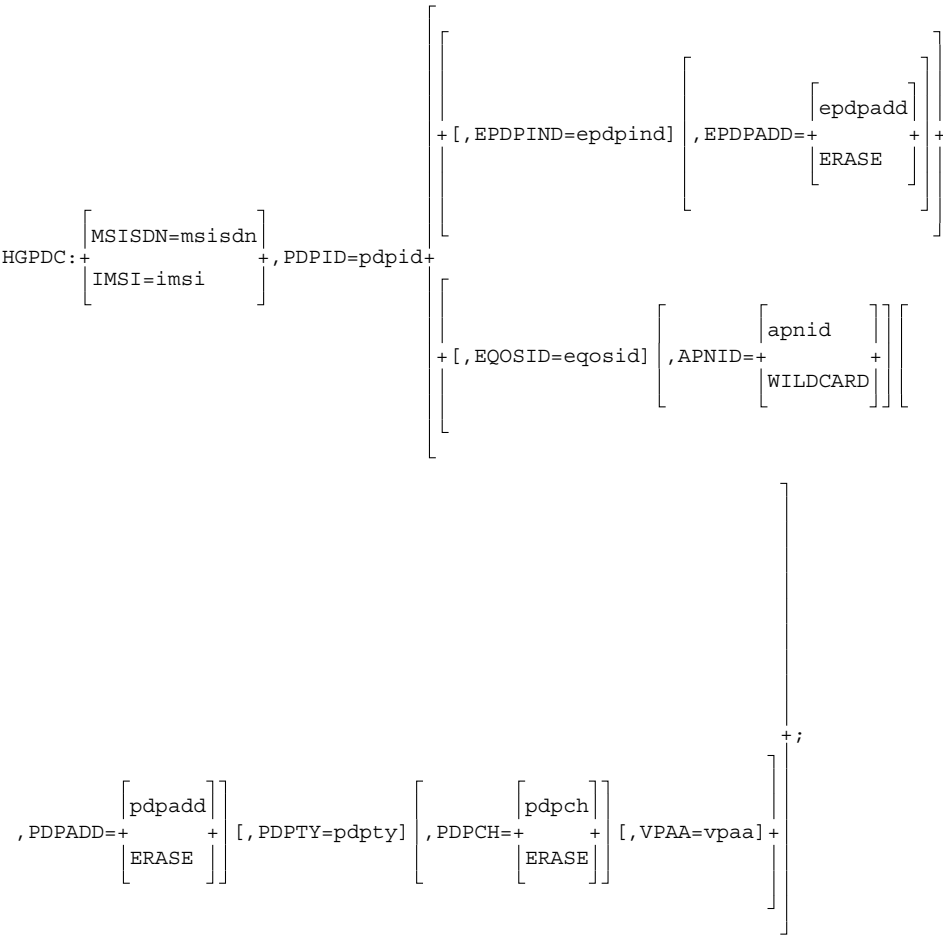
This command changes subscriber PDP context data for a mobile subscriber in the HLR.

Follow the instructions as follows when this command is used:

- If the parameter `APNID` is entered with the value `WILDCARD`, the subscriber PDP context is changed to allow the mobile subscriber to request a non-subscribed `APN`. Only one subscriber PDP context with a non-subscribed `APN` can be defined per PDP context type for the same subscriber.
- If the parameter `PDPADD` is entered with value `ERASE`, the subscriber PDP context is changed to be used for dynamic addressing.
- If the parameter `PDPADD` is entered with an IPv6 address, it is allowed to use “::” which can be used to indicate a group of zeros. “::” can only appear once in an address.
- If the parameter `PDPCH` is entered with no PDP context charging characteristics profile GPRS support node behavior, its default value is assigned.
- If the subscriber PDP context data enables a mobile subscriber to have two PDP context for static addressing, the values in the parameters `APNID`, `PDPADD` and `PDPTY` of such subscriber PDP context data cannot be changed to be the same.
- If the subscriber PDP context data enables a mobile subscriber to have two PDP context for dynamic addressing, the values in the parameters `APNID` and `PDPTY` of such subscriber PDP context data cannot be changed to be the same.
- In the subscriber PDP context data, if a subscriber PDP context uses an IPv4 or IPv6 address, the value type of the parameter of `PDPTY` needs to be the same.
- The value `PPP` of parameter `PDPTY` only can be allowed for dynamic addressing.

5.13.2.1

HGPDC Command Description



Example of an HGPDC Command

```
HGPDC:MSISDN=345678901234567,PDPID=1,EQOSID=3,APNID=1200,PDPADD="5.120.212.40";
```

In the example above, a subscriber PDP context, with APN identifier 1200, specific QoS, and PDP address 5.120.212.40 for a mobile subscriber with MSISDN 345678901234567, is changed. The mobile subscriber is allowed to use the APN and the VPLMN.

5.13.2.1.1

HGPDC Parameters

The following table lists the parameters for the HGPDC command.

**Table 53 HGPDC Parameters**

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
epdpadd	One of the following types: <ul style="list-style-type: none"><li>IPv4</li><li>IPv6</li><li>String, ERASE</li></ul>	Extended PDP context address
epdpind	String Valid values: YES or NO.	Extended PDP context type indicator
eqosid	Decimal, value range:0–4,095.	The extended QoS identifier
apnid	Integer, value range: 0–16,383	The APN identifier
pd padd	One of the following types: <ul style="list-style-type: none"><li>IPv4</li><li>IPv6</li></ul>	The PDP address
pdpty	One of the following strings: <ul style="list-style-type: none"><li>IPv4</li><li>IPv6</li><li>PPP</li></ul> The default value is IPv4.	This parameter indicates the PDP context type.
pdpch	Expressed as <code>pdppi [-pdpgb]</code> : <ul style="list-style-type: none"><li><code>pdppi</code>: this indicates a PDP context charging characteristics profile index (Integer, value range: 0-15).</li><li><code>pdpgb</code>: this indicates a PDP context charging characteristics profile GPRS support node behavior index (integer, value range:0-4095). The default value is 0.</li></ul>	The PDP context charging characteristics
vpaa	Boolean: <ul style="list-style-type: none"><li>YES: the mobile subscriber is allowed to use the APN in the domain of the VPLMN.</li><li>NO: the mobile subscriber is not allowed to use the APN in the domain of the VPLMN.</li></ul>	The VPLMN address is allowed.
pdpid	Integer, value range: 1-50	The PDP context identifier

### 5.13.2.2

### HGPDC Printout

This section lists all HGPDC printouts.



#### 5.13.2.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.13.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.13.2.2.3 Result Printout

This command has no result printouts.

### 5.13.3 Home Location Register, Subscriber Packet Data Protocol Context, End (HGPDE)

This command deletes subscriber PDP context defined for a mobile subscriber in the HLR. Up to five subscriber PDP context identifiers can be entered as a range.

#### 5.13.3.1 HGPDE Command Description

```
HGPDE: + [MSISDN=msisdn]
          [IMSI=imsi] , PDPID=dpid...
```

#### Example of an HGPDE Command

```
HGPDE:MSISDN=345678901234567,PDPID=1;
```

In the example above, the subscription PDP context, with identifier 1 defined for the mobile subscriber with MSISDN 345678901234567, is deleted.

#### 5.13.3.1.1 HGPDE Parameters

The following table lists the parameters for the HGPDE command.

*Table 54 HGPDE Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number



Parameter	Type	Description
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity
pdpid	One of the following types: <ul style="list-style-type: none"><li>Integer, value range: 1–50</li><li>String, ALL</li></ul>	The PDP context identifier

### 5.13.3.2 HGPDE Printout

This section lists all HGPDE printouts.

#### 5.13.3.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.13.3.2.2 Answer Printout

This command has no answer printouts.

#### 5.13.3.2.3 Result Printout

This command has no result printouts.

### 5.13.4 Home Location Register, Subscriber Packet Data Protocol Context, Print (HGPDP)

This command prints the subscriber PDP context data for a subscriber whose subscriber PDP context is defined.

Deviations:

- IMSI or MSISDN series cannot be used in this MML command. All values are considered as individual numbers.
- Only one subscriber is printed.

#### 5.13.4.1 HGPDP Command Description

```
HGPDP: + [MSISDN=msisdns]
        + [IMSI=imsi] ;
```

#### Example of an HGPDP Command



```
HGPDP:MSISDNS=345678901234567;
```

In the example above, the subscriber PDP context data of the connected subscriber with IMSIS is 345678901234567 and subscriber PDP context defined, are printed.

#### 5.13.4.1.1 HGPDP Parameters

The following table lists the parameters for the HGPDP command.

*Table 55 HGPDP Parameters*

Parameter	Type	Description
msisdns	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series
imsis	Digit string, 6–15 digits (value range for each digit: 0–9)	IMSI

#### 5.13.4.2 HGPDP Printout

This section lists all HGPDP printouts.

##### 5.13.4.2.1 Procedure Printout

```
[ ORDERED
+ NOT ACCEPTED
+ fault type ]
```

##### 5.13.4.2.2 Answer Printout

This command has no answer printouts.



## 5.13.4.2.3

## Result Printout

```
HLR SUBSCRIBER PACKET DATA PROTOCOL CONTEXT DATA

MSISDN      IMSI      PDPCP
msisdn      imsi      [pdpcp]

+-----+-----+-----+-----+-----+-----+-----+
| APNID     | PDPADD     | EQOSID  | VPAA  | PDPCH   | PDPTY   | PDPID   |
| [apnid]   | [pdpadd]   | eqosid  | vpaa  | [pdpch] | pdpty   | pdpid   |
|           | [pdpadd]   |         |       |         |         |         |
|           | [EPDPIND   | EPDPADD |         |         |         |         |
|           | epdpind   | [epdpadd] |         |         |         |         |
|           | [epdpadd] |         |         |         |         |         |
|         . |         . |         . |         . |         . |         . |         . |
|         . |         . |         . |         . |         . |         . |         . |
|         . |         . |         . |         . |         . |         . |         . |
|         . |         . |         . |         . |         . |         . |         . |
| [apnid]   | [pdpadd]   | eqosid  | vpaa  | [pdpch] | pdpty   | pdpid   |
|           | [pdpadd]   |         |       |         |         |         |
|           | [EPDPIND   | EPDPADD |         |         |         |         |
|           | epdpind   | [epdpadd] |         |         |         |         |
|           | [epdpadd] |         |         |         |         |         |
+-----+-----+-----+-----+-----+-----+

[NONE]

END
```

The following shows an example including an IPV6 printout.

```
HLR SUBSCRIBER PACKET DATA PROTOCOL CONTEXT DATA

MSISDN      IMSI      PDPCP
491900005010 26400000005010

APNID     PDPADD     EQOSID  VPAA  PDPCH   PDPTY   PDPID
          EPDPIND   EPDPADD
          NO
2        1A25:FFD2:23BC:0121: 1000    NO     11-3289  IPV6   2
          0078:3EE0:0001:652A
          EPDPIND   EPDPADD
          NO
3        256      YES    1-0     PPP     5
          EPDPIND   EPDPADD
          NO

END
```

The following table lists information about the parameters in the HGPDP result printout.

*Table 56 HGPDP Result Printout Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN





Parameter	Type	Description
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	IMSI
epdpadd	<p>One of the following types:</p> <ul style="list-style-type: none"> <li>IPv4: Text string 7 - 15 characters Expressed as oc1.oc2.oc3.oc4 where: oc1 - Octet 1 Numeral 0 - 255 oc2 - Octet 2 Numeral 0 - 255 oc3 - Octet 3 Numeral 0 - 255 oc4 - Octet 4 Numeral 0 - 255</li> <li>IPv6: Text string 2 - 39 characters Expressed as hex1:hex2:hex3:hex4:hex5:hex6:hex7:hex8 where: hex1 - Hexadecimal word 1 Hexadecimal numeral 0 - FFFF hex2 - Hexadecimal word 2 Hexadecimal numeral 0 - FFFF hex3 - Hexadecimal word 3 Hexadecimal numeral 0 - FFFF hex4 - Hexadecimal word 4 Hexadecimal numeral 0 - FFFF hex5 - Hexadecimal word 5 Hexadecimal numeral 0 - FFFF hex6 - Hexadecimal word 6 Hexadecimal numeral 0 - FFFF hex7 - Hexadecimal word 7 Hexadecimal numeral 0 - FFFF hex8 - Hexadecimal word 8 Hexadecimal numeral 0 - FFFF</li> <li>String, ERASE: Extended PDP address is removed from PDP context</li> </ul>	<p>Extended Packet Data Protocol (PDP) address.</p> <p>This parameter allows either an Internet Protocol (IP) version 4 or an IP version 6 address.</p>
epdpind	<p>One of the following strings:</p> <ul style="list-style-type: none"> <li>YES - IPv4v6 Dual Stack is supported.</li> <li>NO - IPv4v6 Dual Stack is not supported</li> </ul>	<p>Extended PDP context type indicator.</p> <p>This parameter indicates either IPv4v6 Dual Stack is supported or not by the PDP Context.</p>
eqosid	Decimal, value range: 0–4,095.	The extended QoS identifier
apnid	Integer, value range: 0–16,383	The APN identifier
pdpadd	<p>One of the following types:</p> <ul style="list-style-type: none"> <li>IPv4</li> <li>IPv6</li> <li>String, ERASE</li> </ul>	The PDP address
pdpty	<p>One of the following types:</p> <ul style="list-style-type: none"> <li>IPv4</li> <li>IPv6</li> <li>PPP</li> </ul>	This parameter indicates the PDP context type. The default value is IPv4.



Parameter	Type	Description
pdpch	Expressed as <code>pdp<i>pi</i> [-pdp<i>gb</i>]</code> : <ul style="list-style-type: none"><li><code>pdp<i>pi</i></code>: this indicates a PDP context charging characteristics profile index (Integer, value range: 0-15).</li><li><code>pdp<i>gb</i></code>: this indicates a PDP context charging characteristics profile GPRS support node behavior index (integer, value range:0-4095). The default value is 0.</li></ul>	The PDP context charging characteristics
vpaa	One of the following strings: <ul style="list-style-type: none"><li><code>YES</code> - the mobile subscriber is allowed to use the APN in the domain of the VPLMN.</li><li><code>NO</code> - : the mobile subscriber is not allowed to use the APN in the domain of the VPLMN.</li></ul>	Visited Public Land Mobile Network (VPLMN) address is allowed.
pdpid	Integer, value range: 1–10	The PDP context identifier
NONE	-	No existent data to be printed

## 5.14 HGPP: PDP Context Profile

This section covers the following MML HLR commands:

- Home Location Register, Packet Data Protocol Context Profile, Change (HGPPC) (Section 5.14.1 on page 118)
- Home Location Register, Packet Data Protocol Context Profile, Print (HGPPP) (Section 5.14.2 on page 121)

### 5.14.1 Home Location Register, Packet Data Protocol Context Profile, Change (HGPPC)

This command changes PDP context profile data in the HLR.

The command initiates a PDP context in a PDP context profile, to change some or all the data of a PDP context in a PDP context profile or to remove PDP contexts in a PDP context profile.

If the given PDP context identifier was not previously defined in the profile, the PDP context is initiated according to the following:

- Extended QOS identifier must be entered.
- If the PDP context type is not entered, the type associated to the PDP context is IPv4.
- If the VPLMN address allowed indicator is not entered, the APN is not allowed to be used in the domain of the VPLMN.



- If APN identifier is not entered, the PDP context request a non-subscribed APN.
- If PDP charging characteristics are not entered, no PDP charging characteristics are associated to the PDP context. It is not allowed to use parameter value ERASE.

If the given PDP context identifier was previously defined in the profile, the PDP context data are changed according to the values of the parameters entered. The remaining PDP context data are not changed.

If parameter ERASE is given, the PDP context is removed from the specified PDP context profile.

Only one PDP context with a non-subscribed APN can be defined per PDP context type in a PDP context profile.

It is not possible to define two PDP contexts in a PDP context profile with the same combination of values in the parameters APNID and PDPTY

When parameter PDPCH is entered with no PDP context charging characteristics profile GPRS support node behavior value, the default value is assigned.

#### 5.14.1.1

#### HGPPC Command Description

$$\begin{array}{l}
 \text{HGPPC:PDPCP=pdpcp, +} \\
 \left[ \begin{array}{l} \text{PDPID=pdpid... ,ERASE} \\ \text{PDPID=pdpid} \left[ \begin{array}{l} \text{[,EQOSID=eqosid] [,PDPTY=pdpty] [,VPAA=vpaa] [,EPDPIND=epdpind]} \end{array} \right] \\ \left[ \begin{array}{l} \text{,APNID=}\left[ \begin{array}{l} \text{apnid} \\ \text{WILDCARD} \end{array} \right] + \\ \text{,PDPCH=1,} + \left[ \begin{array}{l} \text{pdpch} \\ \text{ERASE} \end{array} \right] \end{array} \right] \end{array} \right]
 \end{array}$$

#### Example of an HGPPC Command

```
HGPPC:PDPCP=150,PDPID=9,APNID=WILDCARD,PDPCH=1,ERASE;
```

PDP context data with identifier 9 within PDP context profile 150 are changed. The PDP context request a non-subscribed APN. The charging characteristics



associated to the PDP context are removed. The remaining PDP context data are not changed.

#### 5.14.1.1.1 HGPPC Parameters

The following table contains the parameters for the HGPPC command.

*Table 57 HGPPC Parameters*

Parameter	Type	Description
apnid	Integer 0-16,383 or String WILDCARD	Access Point Name (APN) identifier
epdpind	String Valid values: YES or NO.	Extended PDP context type indicator
eqosid	Integer 0-4,095	Extended Quality of Service (QoS) identifier
erase	-	Erase indicator
pdpch	Expressed as <i>&lt;pdp<i>ppi</i>&gt;-&lt;pdp<i>gb</i>&gt;</i> where <i>&lt;pdp<i>gb</i>&gt;</i> is optional. <i>&lt;pdp<i>ppi</i>&gt;</i> is an integer 0-15. <i>&lt;pdp<i>gb</i>&gt;</i> is an integer 0-4,095. The default value of this parameter is 0. The value of this parameter can also be the string ERASE.	PDP context charging characteristics <i>&lt;pdp<i>ppi</i>&gt;</i> is a PDP context charging characteristics profile index. <i>&lt;pdp<i>gb</i>&gt;</i> is a PDP context charging characteristics profile GPRS support node behavior index. This is an application system-dependent parameter.
pdpcp	Integer 0-8160	PDP context profile
pdpid	Integer, value range: 1-50	PDP context identifier
pdpity	String IPV4, PPP, or IPV6	PDP context type
vpaa	NO APN not allowed to be used in the domain of VPLMN  YES APN allowed to be used in the domain of VPLMN	Visited Public Land Mobile Network (VPLMN) address allowed

#### 5.14.1.2 HGPPC Printout

This section lists all HGPPC printouts.

##### 5.14.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 5.14.1.2.2 Answer Printout

This command has no answer printouts.



#### 5.14.1.2.3 Result Printout

This command has no result printouts.

### 5.14.2 Home Location Register, Packet Data Protocol Context Profile, Print (HGPPP)

This command prints the PDP contexts data of one, several or all the PDP context profiles within the Home Location Register (HLR).

If no parameter is entered, all PDP context profiles data are requested to be printed.

Answer printout HLR PACKET DATA PROTOCOL CONTEXT PROFILE DATA is received.

Deviations:

- PDPCP parameter accepts only one value, not multiple

#### 5.14.2.1 HGPPP Command Description

```
HGPPP[:PDPCP=pdpcp];
```

##### Example of an HGPPP Command

```
HGPPP:PDPCP=1;
```

PDP context data with identifier 1 is printed.

#### 5.14.2.1.1 HGPPP Parameters

The following table explains the parameters for the HGPPP command.

*Table 58 HGPPP Parameters*

Parameter	Type	Description
pdpcp	Integer 0-8160	PDP context profile

#### 5.14.2.2 HGPPP Printout

This section lists all HGPPP printouts.

##### 5.14.2.2.1 Procedure Printout

```
NOT ACCEPTED
fault type
```



### 5.14.2.2.2 Answer Printout

```

HLR PACKET DATA PROTOCOL CONTEXT PROFILE DATA

PDCP APNID EQOSID VPAA PDPCH PDPTY EDPIND PDPID
pdpcp [apnid] eqosid vpaa [pdpch] pdpty edpind dpid
      .      .      .      .      .      .      .
      .      .      .      .      .      .      .
      [apnid] eqosid vpaa [pdpch] pdpty edpind dpid

END

```

The following table contains information about the parameters in the HGPPP answer printout:

*Table 59 HGPPP Answer Printout Parameters*

Parameter	Type	Description
apnid	Integer 0-16,383	Access Point Name (APN) identifier
edpind	String Valid values: YES or NO.	Extended PDP context type indicator
eqosid	Integer 0-4,095	Extended Quality of Service (QoS) identifier
pdpch	String 2-7 characters	PDP context charging characteristics <sup>(1)</sup>
pdpcp	Integer 0-8160	PDP context profile
dpid	Integer, value range: 1-50	PDP context identifier
pdpty	Enumeration; one of the following strings: <ul style="list-style-type: none"><li>IPv4</li><li>PPP</li><li>IPv6</li></ul>	PDP context type
vpaa	NO APN not allowed to be used in the domain of VPLMN  YES APN allowed to be used in the domain of VPLMN	Visited Public Land Mobile Network (VPLMN) address allowed

*(1) The PDPCH attribute is printed only if the PDP context charging characteristics validity indicator for PDP context identifier (PDPCHCPVID) identifies it as a valid PDP context charging characteristics.*

### 5.14.2.2.3 Result Printout

This command has no result printouts.

## 5.15 HGSD: Subscriber Data

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Data, Change (HGSDC) (Section 5.15.1 on page 123)



- Home Location Register, Subscriber Data, Print (HGSDP) (Section 5.15.2 on page 124)

## 5.15.1 Home Location Register, Subscriber Data, Change (HGSDC)

This command changes subscriber data, specifying data to be changed by parameter `SUD`, or a set of data previously defined by parameter `PROFILE`.

### 5.15.1.1 HGSDC Command Description

```
HGSDC:MSISDN=msisdn,[SUD=sud
                        +
                        PROFILE=profile];
```

#### Example of an HGSDC Command

```
HGSDC:MSISDN=123456789012345,SUD=CFU-1;
```

Call forwarding unconditional is provided for the mobile subscriber with MSISDN 123456789012345.

#### 5.15.1.1.1 HGSDC Parameters

The following table explains the parameters for the HGSDC command.

*Table 60 HGSDC Parameters*

Parameter	Type	Description
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
profile	Integer 0-8192	Subscriber profile
sud	String <sup>(1)</sup> Expressed as a-b[-c] where: a - Subscriber Data (SUD) code b - SUD value part 1 c - SUD value part 2	Subscriber Data

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

#### 5.15.1.2 HGSDC Printout

This section lists all HGSDC printouts.



#### 5.15.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.15.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.15.1.2.3 Result Printout

This command has no result printouts.

### 5.15.2 Home Location Register, Subscriber Data, Print (HGSDP)

This command prints subscriber data for mobile subscribers in the HLR.

Deviations:

- MSISDN and IMSI can only accept one value, not multiple.
- Parameter CONNECTED is not allowed in the request.
- Parameter SUDA, SSDA, LOC, PDP, and MSIM are not allowed in the request, only parameter ALL is allowed but has no effect on the response.
- All Subscriber Data are printed, regardless of the parameter provided.

#### 5.15.2.1 HGSDP Command Description

$$\text{HGSDP:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right] \left[ \text{, ALL} \right];$$

#### Example of an HGSDP Command

```
HGSDP:IMSI=123456789012345,ALL;
```

All subscriber data for the mobile subscriber with IMSI 123456789012345 is printed.

#### 5.15.2.1.1 HGSDP Parameters

The following table contains the parameters for the HGSDP command.



Table 61 HGSDP Parameters

Parameter	Type	Description
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
ALL	String	All subscriber data

5.15.2.2 HGSDP Printout

This section lists all HGSDP printouts.

5.15.2.2.1 Procedure Printout

NOT ACCEPTED  
fault type

5.15.2.2.2 Answer Printouts

HLR SUBSCRIBER DATA

Deviations:

- FAULT INTERRUPT is not supported
- SUBSCRIBER DISCONNECTED DURING PRINTOUT is not supported

```
HLR SUBSCRIBER DATA

SUBSCRIBER IDENTITY
MSISDN          IMSI                STATE          AUTHD
[msisdn]        [imsi]              state           [authd]

[
  [
    NAM
    nam
  ]
  [
    IMEISV
    imeisv
  ]
  [
    RID
    rid
  ]

  [PERMANENT SUBSCRIBER DATA]

  [SUPPLEMENTARY SERVICE DATA]

  [LOCATION DATA]

  [PACKET DATA PROTOCOL CONTEXT DATA]

  [MULTIPLE SUBSCRIPTION DATA]
]
```

END

The following table contains information about the parameters in the HGSDP answer printout:

**Table 62** *HGSDP Answer Printout HLR SUBSCRIBER DATA Parameters*

Attribute	Type	Description
authd	One of the following strings: <ul style="list-style-type: none"> <li>• AVAILABLE</li> <li>• NO IMSI IN AUC</li> <li>• NO ACCESS TO AUC</li> </ul>	Authentication data <sup>(1)</sup>
imeisv	Digit string 0-16 digits. The characters can be 0-9 and £.	International Mobile Equipment Identity and Software Version
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
nam	Integer 0-2 0 - Both, General Packet Radio Service (GPRS) and non-GPRS 1 - Non-GPRS 2 - GPRS	Network Access Mode
rid	Integer 0-31	Region ID for the multi-region support
state	One of the following strings: <ul style="list-style-type: none"> <li>• NOT CONNECTED</li> <li>• CONNECTED</li> <li>• ADDITIONAL</li> </ul>	State corresponding to the subscription or number
status	One of the following strings: <ul style="list-style-type: none"> <li>• ACTIVE-OP</li> <li>• ACTIVE-QS</li> <li>• NOT ACTIVE</li> </ul>	Status of the SS

(1) *AUTHINFO* is only available if subscriber earlier has initiated an Authentication Procedure ("Send Authentication Information" MAP operation has been received for a specific subscriber).

## LOCATION DATA

### Deviations:

- SERVICES RESTRICTED IN VLR is not supported
- SERVICES INDUCED IN VLR is not supported
- SERVICES RESTRICTED IN SGSN is not supported
- SERVICES INDUCED IN SGSN is not supported



```

LOCATION DATA
[
  VLR ADDRESS      MSRN      MSC NUMBER      LMSID
  vlraddress      [msrn]    [mscnumber]    [lmsid]

  [MSC-AREA RESTRICTED]

  [MS PURGED IN VLR]

]

[
  SGSN NUMBER
  sgsnnumber

  [MS PURGED IN SGSN]

]

```

The following table contains information about the parameters in the LOCATION DATA HGSDP answer printout:

**Table 63** HGSDP Answer Printout LOCATION DATA Parameters

Attribute	Type	Description
lmsid	String 0-16 characters	Local Mobile Station Identity
mscNumber	String 0-16 characters	MSC number
msrn	String 0-16 characters	Mobile Station Roaming Number
sgsnNumber	String expressed as <na>-<ai> or UNKNOWN, RESTRICTED, or BARRED. <ul style="list-style-type: none"> <li>• &lt;na&gt; is Nature of Address, and can have value 3 for National and 4 for International.</li> <li>• &lt;ai&gt; is address information; digit string where each digit is 0-9.</li> </ul>	SGSN number
vlraddress	String expressed as <na>-<ai> or UNKNOWN, RESTRICTED, or BARRED. <ul style="list-style-type: none"> <li>• &lt;na&gt; is Nature of Address, and can have value 3 for National and 4 for International.</li> <li>• &lt;ai&gt; is address information; digit string where each digit is 0-9.</li> </ul>	VLR address
MS PURGED IN SGSN	-	The Mobile Station (MS) has been purged from the SGSN.
MS PURGED IN VLR	-	The MS has been purged from the VLR.
MSC-AREA RESTRICTED	-	The MSC area is restricted.

## MULTIPLE SUBSCRIPTION DATA



## MULTIPLE SUBSCRIPTION DATA

```
MSISDN      IMSI      ACTIVE  MCH
msisdn      imsi      active  mch
.
.
.
imsi        active
```

The following table contains information about the parameters in the MULTIPLE SUBSCRIPTION DATA HGSDP answer printout:

**Table 64** HGSDP Answer Printout MULTIPLE SUBSCRIPTION DATA Parameters

Attribute	Type	Description
active	YES - Subscription active NO - Subscription not active	Active subscription indicator
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
mch	One of the following strings: <ul style="list-style-type: none"><li>LOC - Location updating mechanism.</li><li>USSD - Subscriber procedure based on Unstructured Supplementary Service Data (USSD).</li></ul>	Multiple subscription activation mechanism.
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number

## PACKET DATA PROTOCOL CONTEXT DATA

## PACKET DATA PROTOCOL CONTEXT DATA

```
APNID      PDPADD      EQOSID  VPAA  PDPCH  PDPTY  PDPID
[apnid]    [pdpadd]    eqosid  vpaa  [pdpch]  pdpty  pdpid
          [pdpadd]
          [
            EPDPIND  EPDPADD
            epdpind  [epdpadd]
                    [epdpadd]
          ]
.
.
.
[apnid]    [pdpadd]    eqosid  vpaa  [pdpch]  pdpty  pdpid
          [pdpadd]
          [
            EPDPIND  EPDPADD
            epdpind  [epdpadd]
                    [epdpadd]
          ]

[NONE]
```

The following shows an example including an IPV6 printout.



```

PACKET DATA PROTOCOL CONTEXT DATA
APNID PDPADD EQOSID VPAA PDPCH PDPTY PDPID
  3 192.168.55.189 2 NO 11-3289 IPV4 1
    EPDPIND EPDPADD
    NO 192.168.55.189
    2001:0db8:85a3:0042: 2 NO IPV6 2
    0000:8a2e:0370:7334
    EPDPIND EPDPADD
    NO 2001:0db8:85a3:0042:
    0000:8a2e:0370:7334
  5 192.168.55.189 2 NO 11-3289 IPV4 1
    192.168.55.189 2 NO IPV4 2
    EPDPIND EPDPADD
    NO 2001:0db8:85a3:0042:
    0000:8a2e:0370:7334

```

The following table contains information about the parameters in the PACKET DATA PROTOCOL CONTEXT DATA HGSDP answer printout:

**Table 65** *HGSDP Answer Printout PACKET DATA PROTOCOL CONTEXT DATA Parameters*

Attribute	Type	Description
apnid	Numeral 0 - 16383	APN identifier
eqosid	Integer 0-4095	Extended Quality of Service (QoS) identifier
epdpadd	One of the following types: <ul style="list-style-type: none"> <li>IPv4: Text string 7 - 15 characters Expressed as oc1.oc2.oc3.oc4 where: oc1 - Octet 1 Numerical 0 - 255 oc2 - Octet 2 Numerical 0 - 255 oc3 - Octet 3 Numerical 0 - 255 oc4 - Octet 4 Numerical 0 - 255</li> <li>IPv6: Text string 2 - 39 characters Expressed as hex1:hex2:hex3:hex4:hex5:hex6:hex7:hex8 where: hex1 - Hexadecimal word 1 Hexadecimal numeral 0 - FFFF hex2 - Hexadecimal word 2 Hexadecimal numeral 0 - FFFF hex3 - Hexadecimal word 3 Hexadecimal numeral 0 - FFFF hex4 - Hexadecimal word 4 Hexadecimal numeral 0 - FFFF hex5 - Hexadecimal word 5 Hexadecimal numeral 0 - FFFF hex6 - Hexadecimal word 6 Hexadecimal numeral 0 - FFFF hex7 - Hexadecimal word 7 Hexadecimal numeral 0 - FFFF hex8 - Hexadecimal word 8 Hexadecimal numeral 0 - FFFF</li> <li>String, ERASE: Extended PDP address is removed from PDP context</li> </ul>	Extended Packet Data Protocol (PDP) address.  This parameter allows either an Internet Protocol (IP) version 4 or an IP version 6 address.



Attribute	Type	Description
epdpind	One of the following strings: <ul style="list-style-type: none"><li>• YES - IPv4v6 Dual Stack is supported.</li><li>• NO - IPv4v6 Dual Stack is not supported</li></ul>	Extended PDP context type indicator.  This parameter indicates either IPv4v6 Dual Stack is supported or not by the PDP Context.
pdpadd	String 1-15 characters	PDP address
pdpch	String 2-7 characters	PDP context charging characteristics
pdpid	Integer, value range: 1–10	PDP context identifier
pdpty	One of the following strings: <ul style="list-style-type: none"><li>• IPV4</li><li>• PPP</li><li>• IPV6</li></ul>	PDP context type
vpaa	One of the following strings: <ul style="list-style-type: none"><li>• YES - the mobile subscriber is allowed to use the APN in the domain of the VPLMN.</li><li>• NO - the mobile subscriber is not allowed to use the APN in the domain of the VPLMN.</li></ul>	Visited Public Land Mobile Network (VPLMN) address is allowed.

## PERMANENT SUBSCRIBER DATA

```
PERMANENT SUBSCRIBER DATA
SUD
sud...sud
.      .
.      .
.      .
sud...sud

[ sud          sud ]
[ .            . ]
[ .            . ]
[ .            . ]
[ sud         sud ]

AMsISDN      BS      BC
amsisdn      [bs]    bc
.            .
.            .
.            .
amsisdn      [bs]    bc

[NONE]
```

The following table contains information about the parameters in the PERMANENT SUBSCRIBER DATA HGSDP answer printout:

*Table 66 HGSDP Answer Printout PERMANENT SUBSCRIBER DATA Parameters*

Attribute	Type	Description
amsisdn	Digit string 5-15 digits. Each digit is 0-9.	Additional MSISDN



Attribute	Type	Description
bc	Integer 0, 1, or any value in the range 10-65535	Public Land Mobile Network (PLMN) Bearer Capability (BC) number
bs	String <sup>(1)</sup>	Basic Service (BS)
sud	String <sup>(1)</sup> Expressed as a-b[-c] where: a - SUD code b - SUD value part 1 c - SUD value part 2	Subscriber Data (SUD)

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

## SUPPLEMENTARY SERVICE DATA

### SUPPLEMENTARY SERVICE DATA

```

BSG
bsg
SS      STATUS      FNUM      TIME
          SADD
ss      status      [ fnum      [time]
                   [sadd]
.
.
.
ss      status      [ fnum      [time]
                   [sadd]
.
.
.
BSG
bsg
SS      STATUS      FNUM      TIME
          SADD
ss      status      [ fnum      [time]
                   [sadd]
.
.
.
ss      status      [ fnum      [time]
                   [sadd]
[PASSWORD BARRED]
[MCF ACTIVE]
```

The following table contains information about the parameters in the SUPPLEMENTARY SERVICE DATA HGSDP answer printout:



**Table 67 HGSDP Answer Printout SUPPLEMENTARY SERVICE DATA Parameters**

Attribute	Type	Description
bsg	String <sup>(1)</sup>	Basic Service Group (BSG)
fnum	String 0-15 characters. Acceptable characters are 0-9, a-z, A-Z, *, and #.	Forwarded-to number
sadd	String 0-45 characters	Forwarded-to subaddress information
ss	Text string <sup>(1)</sup>	Supplementary Service
status	One of the following strings: <ul style="list-style-type: none"><li>• ACTIVE-OP</li><li>• ACTIVE-QS</li><li>• NOT ACTIVE</li></ul>	Status of the SS
time	Integer 5-30	No reply condition time in seconds
MCF ACTIVE	-	The call forwarding registrations initiated by the mobile subscriber are being monitored.
PASSWORD BARRED	-	The mobile subscriber is barred from using password controlled procedures because of password misuse.

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

#### 5.15.2.2.3

#### Result Printout

This command has no result printouts.

## 5.16

## HGSG: Subscriber Location Services Address

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Location Services Address, Initiate (HGSGI) (Section 5.16.1 on page 132)
- Home Location Register, Subscriber Location Services Address, End (HGSGE) (Section 5.16.2 on page 134)
- Home Location Register, Subscriber Location Services Address, Print (HGSGP) (Section 5.16.3 on page 135)

### 5.16.1

### Home Location Register, Subscriber Location Services Address, Initiate (HGSGI)

This command assigns the addresses of the LCS nodes (GMLC, home GMLC, and privacy profile register) to a mobile subscriber in the HLR. Make sure to meet the following rules when assigning addresses:

- Up to five GMLC addresses can be assigned to one mobile subscriber.





- Only one home GMLC address can be assigned to one mobile subscriber.
- Only one privacy profile register address can be assigned to one mobile subscriber.

### 5.16.1.1 HGSGI Command Description

```

HGSGI:MSISDN=msisdn,
  [ GMLCID=gmlcid...
    HGMLCID=hgmlcid
    PPRID=pprid
  ] ;

```

#### Example of an HGSGI Command

```
HGSGI:MSISDN=345678901234567,GMLCID=33;
```

In the example above, the GMLC address with identifier 33 is assigned to the mobile subscriber with MSISDN 345678901234567.

### 5.16.1.1.1 HGSGI Parameters

The following table lists the parameters for the HGSGI command.

*Table 68 HGSGI Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
gmlcid	Integer, value range: 0–255	The GMLC address identifier
hgmlcid	Integer, value range: 0–255	The home GMLC address identifier
pprid	Integer, value range: 0–255	The Privacy Profile Register (PPR) address identifier

### 5.16.1.2 HGSGI Printout

This section lists all HGSGI printouts.

#### 5.16.1.2.1 Procedure Printout

```

EXECUTED
NOT ACCEPTED
fault type

```

#### 5.16.1.2.2 Answer Printout

This command has no answer printouts.



### 5.16.1.2.3 Result Printout

This command has no result printouts.

## 5.16.2 Home Location Register, Subscriber Location Services Address, End (HGSGE)

This command deletes the addresses of the LCS nodes (GMLC, home GMLC, and privacy profile register) previously assigned to a GMLC, home GMLC, and PPR mobile subscriber in the HLR.

### 5.16.2.1 HGSGE Command Description

$$\text{HGSGE:MSISDN=msisdn,} \left[ \begin{array}{l} \text{GMLCID=gmlcid...} \\ \text{+HGMLC} \\ \text{PPR} \end{array} \right] + ;$$

#### Example of an HGSGE Command

```
HGSGE:MSISDN=345678901234567,GMLCID=33;
```

In this example, GMLC address with identifier 33 is deleted from the GMLC addresses assigned to the mobile subscriber with MSISDN 345678901234567.

```
HGSGE:MSISDN=345678901234567,HGMLC;
```

In this example, the assigned home GMLC address is deleted for the mobile subscriber with MSISDN 345678901234567.

#### 5.16.2.1.1 HGSGE Parameters

The following table lists the parameters for the HGSGE command.

*Table 69 HGSGE Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
gmlcid	One of the following values <ul style="list-style-type: none"><li>Integer, value range: 0–255</li><li>String: ALL</li></ul>	The GMLC address identifier
HGMLC	-	The home GMLC
PPR	-	The privacy profile register



### 5.16.2.2 HSGSE Printout

This section lists all HSGSE printouts.

#### 5.16.2.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.16.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.16.2.2.3 Result Printout

This command has no result printouts.

### 5.16.3 Home Location Register, Subscriber Location Services Address, Print (HGSGP)

This command prints the addresses of the LCS nodes (GMLC, Home GMLC, and privacy profile register) and the corresponding identifiers assigned to a series of connected subscribers with any LCS address defined.

Follow the instructions as follows when this command is used:

- If the parameter `GMLC` is given, the subscriber GMLC addresses and their corresponding identifiers are printed.
- If the parameter `HGMLC` is given, the subscriber HGMLC address and the corresponding identifier are printed.
- If the parameter `PPR` is given, the subscriber privacy profile register address and the corresponding identifier are printed.
- If none of the parameter `GMLC`, `HGMLC` or `PPR` is entered in the command, subscriber GMLC, Home GMLC, and privacy profile register address and the corresponding identifiers are printed.

Deviations:

- This MML command does not support MSISDN series.
- Only one subscriber is printed in the printout.



### 5.16.3.1 HGSGP Command Description

$$\text{HGSGP:MSISDNS=msisdns} \left[ , \text{GMLC} \right] \left[ , \text{HGMLC} \right] \left[ , \text{PPR} \right] ;$$

#### Example of an HGSGP Command

HGSGP:MSISDNS=345678901234567;

In this example, the GMLC, home GMLC, privacy profile register addresses, and the corresponding identifiers for the connected subscribers with MSISDN 345678901234567 are printed.

HGSGP:MSISDNS=345678901234567,GMLC,PPR;

In this example, the home GMLC address, the privacy profile register address, and the corresponding identifiers for the connected subscribers with MSISDN 345678901234567 are printed.

#### 5.16.3.1.1 HGSGP Parameters

The following table lists the parameters for the HGSGP command.

*Table 70 HGSGP Parameters*

Parameter	Type	Description
msisdns	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series
GMLC	-	The identifier of the GMLC address
HGMLC	-	The home GMLC
PPR	-	The privacy profile register

### 5.16.3.2 HGSGP Printout

This section lists all HGSGP printouts.

#### 5.16.3.2.1 Procedure Printout

$$\left[ \begin{array}{l} \text{ORDERED} \\ + \\ \text{NOT ACCEPTED} \\ \text{fault type} \end{array} \right]$$



### 5.16.3.2.2 Answer Printout

This command has no answer printouts.

### 5.16.3.2.3 Result Printout

HLR SUBSCRIBER LOCATION SERVICES ADDRESS DATA

MSISDN  
msisdn

GMLCID	GMLCADD
gmlcid	gmlcadd
.	.
.	.
gmlcid	gmlcadd

HGMLCID	HGMLCADD
hgmlcid	hgmlcadd

PPRID	PPRADD
pprid	ppradd

[NONE]

END

The following table contains information about the parameters in the HGSGP result printout.

**Table 71** HGSGP Result Printout Parameters

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
gmlcid	Integer, value range: 2–255	The GMLC address identifier
gmlcadd	Digit string, 3–15 digits (value range for each digit: 0–9)	The GMLC address
hgmlcid	Integer, value range: 0–255	The home GMLC address identifier
hgmlcadd	<ul style="list-style-type: none"> <li>IPv4 address</li> <li>IPv6 address</li> </ul>	The home GMLC address
pprid	Integer, value range: 0–255	The identifier of the privacy profile register address
ppradd	<ul style="list-style-type: none"> <li>IPv4 address</li> <li>IPv6 address</li> </ul>	The privacy profile register address

## 5.17 HGSL: Mobile Subscriber Location

This section covers the following MML HLR command:



- Home Location Register, Mobile Subscriber Location, Reset (HGSLR)  
(Section 5.17.1 on page 138)

## 5.17.1 Home Location Register, Mobile Subscriber Location, Reset (HGSLR)

This command sets the location of the mobile subscriber to the unknown status.

When the location is reset, the cancelation procedure towards VLR and the SGSN, in which the mobile subscriber is saved, is initiated.

### 5.17.1.1 HGSLR Command Description

$$\text{HGSLR:} \left[ \begin{array}{l} \text{IMSI=imsi} \\ \text{MSISDN=msisdn} \end{array} \right]^+ ;$$

#### Example of an HGSLR Command

```
HGSLR:IMSI=123456789012345;
```

In the example above, the location of the mobile subscriber with IMSI 123456789012345 is set to the unknown status.

#### 5.17.1.1.1 HGSLR Parameters

The following table lists the parameters for the HGSLR command.

*Table 72 HGSLR Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string, 6–15 digits (value range for each digit: 0–9)	International Mobile Subscriber Identity

### 5.17.1.2 HGSLR Printout

This section lists all HGSLR printouts.

#### 5.17.1.2.1 Check Printout

Yes.



#### 5.17.1.2.2 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.17.1.2.3 Answer Printout

This command has no answer printouts.

#### 5.17.1.2.4 Result Printout

This command has no result printouts.

## 5.18 HGSN: Subscriber Network Access Mode

This section covers the following MML HLR command:

- Home Location Register, Subscriber Network Access Mode, Change (HGSNC) (Section 5.18.1 on page 139).

### 5.18.1 Home Location Register, Subscriber Network Access Mode, Change (HGSNC)

This command changes the NAM of a mobile subscriber.

If parameter `KEEP` is entered, the subscriber data related to the network which access is not allowed are not deleted.

The `HGSNC` command is fault tolerant in the sense that it is always possible to execute, even if a previous `HGSNC` has failed.

#### 5.18.1.1 HGSNC Command Description

```
HGSNC: + [MSISDN=msisdn] + , NAM=nam [ , KEEP ] ;
        [IMSI=imsi]
```

#### Example of an HGSNC Command

```
HGSNC:MSISDN=123456789012345,NAM=1;
```

NAM for the mobile subscriber with MSISDN 123456789012345 is changed to non-GPRS. Subscriber data related to the GPRS network are deleted.



#### 5.18.1.1.1 HGSNC Parameters

The following table contains the parameters for the HGSNC command.

*Table 73 HGSNC Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
keep	-	Keep subscriber data
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
nam	Integer 0-2	Network Access Mode (NAM)

#### 5.18.1.2 HGSNC Printout

This section lists all HGSNC printouts.

##### 5.18.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 5.18.1.2.2 Answer Printout

This command has no answer printouts.

##### 5.18.1.2.3 Result Printout

This command has no result printouts.

### 5.19 HGSP: Subscriber Profile

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Profile, Change (HGSPC) (Section 5.19.1 on page 140)
- Home Location Register, Subscriber Profile, Print (HGSP) (Section 5.19.2 on page 141)

#### 5.19.1 Home Location Register, Subscriber Profile, Change (HGSPC)

This command changes a group of SUD in a profile.





### 5.19.1.1 HGSPC Command Description

```
HGSPC:PROFILE=profile,SUD=sud...[,HLRFEID=hlrfeid];
```

#### Example of an HGSPC Command

```
HGSPC:PROFILE=101,SUD=TS12-1&DBSG-5;
```

Teleservice emergency call is set to subscribed and default basic service group is set to all data circuit asynchronous services in subscriber profile number 101.

#### 5.19.1.1.1 HGSPC Parameters

The following table contains the parameters for the HGSPC command.

*Table 74 HGSPC Parameters*

Parameter	Type	Description
profile	Integer, value range: 0-8192	Subscriber profile
sud	String <sup>(1)</sup>	SUD
hlrfeid	Text string	The hlrfeid where to send the command. Normally, the hlrfeid is omitted, which means the order is executed in all HLR Front Ends.

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.19.1.2 HGSPC Printout

This section lists all HGSPC printouts.

#### 5.19.1.2.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.19.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.19.1.2.3 Result Printout

This command has no result printouts.

## 5.19.2 Home Location Register, Subscriber Profile, Print (HGSPP)

Command HGSPP initiates the printout HLR SUBSCRIBER PROFILE DATA.



Deviations:

- PROFILE parameter accepts only one value, not multiple.

### 5.19.2.1 HGSP Command Description

$$\text{HGSP:PROFILE} = \begin{matrix} \left[ \begin{matrix} \text{profile} \\ \text{ALL} \end{matrix} \right] + [ , \text{HLRFEID} = \text{hlrfeid} ] ; \end{matrix}$$

#### Example of an HGSP Command

```
HGSP:PROFILE=1;
```

The subscriber data specified in subscriber profile 1 is printed

#### 5.19.2.1.1 HGSP Parameters

The following table contains the parameters for the HGSP command.

*Table 75 HGSP Parameters*

Parameter	Type	Description
profile	Integer 0-8192 or String ALL	Subscriber profile
hlrfeid	Text string	The hlrfeid where to send the command. Normally, the hlrfeid is omitted, which means the order is executed in all HLR Front Ends.

### 5.19.2.2 HGSP Printout

This section lists all HGSP printouts.

#### 5.19.2.2.1 Procedure Printout

```
NOT ACCEPTED  
fault type
```

#### 5.19.2.2.2 Answer Printout

HLR SUBSCRIBER PROFILE DATA

Deviations:

- FAULT INTERRUPT is not supported.

```
HLR SUBSCRIBER PROFILE DATA

PROFILE
profile

SUD
sud...sud
.      .
.      .
.      .
sud...sud

[sud      sud
 .      .
 .      .
 .      .
 sud     sud]

END
```

The following table contains information about the parameters in the HGSP answer printout:

Table 76 HGSP Answer Printout Parameters

Parameter	Type	Description
profile	Integer 0-8192	Subscriber profile
sud	String <sup>(1)</sup>	Subscriber Data

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference* [6].

5.19.2.2.3

Result Printout

This command has no result printouts.

5.20

HGSS: Supplementary Service

This section covers the following MML HLR commands:

- Home Location Register, Supplementary Service, Initiate (HGSSI) (Section 5.20.1 on page 143)
- Home Location Register, Supplementary Service, End (HGSSE) (Section 5.20.2 on page 146)

5.20.1

Home Location Register, Supplementary Service, Initiate (HGSSI)

This command registers, activates, or both, an SS for a Mobile Subscriber (MS).

The registration and activation of the SS applies to the BSG specified in the command. If parameter BSG, is not specified in the command the registration and activation of the SS applies to all applicable BSGs which have got some individual Basic Service (BS) subscribed to.

Parameter `FNUM` is only accepted when the command is intended to register a call forwarding service.

If parameter `FNUM` contains characters different from decimal digits, parameter `OFA` with value 512 is required.

When parameter `OFA` is required, and has not been specified in the command, a value assigned as default to the MS is used.

If the specified `SS` requires the parameter `TIME`, and it has not been given in the command:

- If the `SS` was already registered, the previous “no reply condition time” applies.
- If the `SS` was not registered, the default value for the “no reply condition time” applies.

When registering a call forwarding service, if parameter `SADD` has been specified the forward-to subaddress is tied to the forwarded-to number.

When specifying a subaddress only an even number of characters is allowed (either an even number of significant digits or an odd number of significant digits and a filler).

When registering a call forwarding service, if the parameter `SADD` has not been specified, no forward-to subaddress is tied to the forwarded-to number and, also any forward-to subaddress previously stored for the call forwarding service, in the `BSGs` that applies to the given command, is removed.

Activation of an `SS` can fail because of interaction or because of the `MS` current location. When successful, the status of another `SS` can change.

For the same reasons, explicit activation or activation as result of a registration of a group of `SS` at a time can make some of the `SS` that the group comprises be active-operative, while the rest become active-quiescent.

When the command given indicates all applicable `BSGs` which have got some individual `BS` subscribed to, interactions among `SS` or interactions because of `MS` location within each `BSG`, can lead to a 'partially successful execution', since some `BSGs` can accept activation of the requested `SS`, while others cannot. In this case, `PARTLY EXECUTED` is printed.

Deviations:

- `PARTLY EXECUTED` not supported.  
For example, in case of `BAOC-CFx` interaction, `PARTLY EXECUTED` will not be returned.



### 5.20.1.1 HGSSI Command Description

```
HGSSI:MSISDN=msisdn,SS=ss[,BSG=bsg][,FNUM=fnum  
[,OFA=ofa][,TIME=time][,SADD=sadd];
```

#### Example of an HGSSI Command

```
HGSSI:MSISDN=123456789012345,SS=CFNRY,FNUM=15895800,OFA=1,  
TIME=15;
```

Call Forwarding on Mobile Subscriber No Reply (CFNRY) is registered, with forwarded-to number 15895800, 1 as origin for forward-to number analysis, and the no reply condition timer equal to 15 seconds, for all applicable BSGs which have got some individual BS subscribed to, for the MS with MSISDN 123456789012345.

#### 5.20.1.1.1 HGSSI Parameters

The following table contains the parameters for the HGSSI command.

*Table 77 HGSSI Parameters*

Parameter	Type	Description
bsg	String <sup>(1)</sup>	BSG
fnum	String 0-15 characters. Acceptable characters are 0-9, a-z, A-Z, *, and #.	Forwarded-to number
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
ofa	Integer 0-512	Origin for forwarded-to number analysis
sadd	String 0-45 characters	Forwarded-to subaddress information
ss	Text string <sup>(1)</sup>	Supplementary Service
time	Integer 5-30	No reply condition time in seconds

*(1) For more information, see HLR Subscriber Data Type Definitions, Reference [6].*

### 5.20.1.2 HGSSI Printout

This section lists all HGSSI printouts.

#### 5.20.1.2.1 Procedure Printout

```
EXECUTED
```

```
fault type
```

```
NOT ACCEPTED
```

```
fault type
```



#### 5.20.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.20.1.2.3 Result Printout

This command has no result printouts.

### 5.20.2 Home Location Register, Supplementary Service, End (HGSSE)

This command erases, deactivates or both an SS for a Mobile Subscriber (MS).

The deactivation and erasure of the SS applies to the BSG specified in the command. If parameter BSG is not given in the command, the deactivation and erasure of the SS applies to all applicable BSGs which have got some individual Basic Services (BS) subscribed to.

If the parameter KEEP is given in the command, the SS is deactivated. Information related to the SS, for example forwarded-to number, forwarded-to subaddress and no reply condition time for call forwarding service, cannot be erased. If parameter KEEP is not given, the service is deactivated and erased.

#### 5.20.2.1 HGSSE Command Description

```
HGSSE:MSISDN=msisdn,SS=ss[,BSG=bsg][,KEEP];
```

##### Example of an HGSSE Command

```
HGSSE:MSISDN=123456789012345,SS=CFNRC,BSG=TS10,KEEP;
```

Call Forwarding on Mobile Subscriber Not Reachable (CFNRC) is deactivated for BSG all Speech Transmission services (TS10) for the MS with MSISDN 123456789012345. The information related to the SS is kept.

#### 5.20.2.1.1 HGSSE Parameters

The following table contains the parameters for the HGSSE command.

*Table 78 HGSSE Parameters*

Parameter	Type	Description
bsg	String <sup>(1)</sup>	BSG
keep	-	Keep the data related to the Supplementary Service (SS)



Parameter	Type	Description
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
ss	Text string <sup>(1)</sup>	Supplementary Service

(1) For more information, see *HLR Subscriber Data Type Definitions, Reference [6]*.

### 5.20.2.2 HGSSE Printout

This section lists all HGSSE printouts.

#### 5.20.2.2.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

#### 5.20.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.20.2.2.3 Result Printout

This command has no result printouts.

## 5.21 HGSU: Subscription

This section covers the following MML HLR commands:

- Home Location Register, Subscription, Initiate (HGSUI) (Section 5.21.1 on page 147)
- Home Location Register, Subscription, End (HGSUE) (Section 5.21.2 on page 149)
- Home Location Register, Subscription, Print (HGSUP) (Section 5.21.3 on page 150)

### 5.21.1 Home Location Register, Subscription, Initiate (HGSUI)

This command initiates the subscription of a new mobile subscriber or an LMU subscriber in the Home Location Register (HLR).

At subscription, a set of subscriber data is given to the subscriber by a profile. Only the applicable profile data for an LMU subscriber is provided.

If parameter `PROFILE` is omitted, subscriber profile 0 is used as default.



The location of the new mobile subscriber is set to unknown.

This command also initiates a request for authentication data from an external Authentication Center.

An exchange parameter determines whether the command waits for the result of the authentication data request or not. The fault codes relating to authentication data only apply when this parameter is set.

### 5.21.1.1 HGSUI Command Description

```
HGSUI:IMSI=imsi,MSISDN=msisdn[,PROFILE=profile][,LMU][,ZONEID=zoneid][,RID=rid];
```

#### Example of an HGSUI command

```
HGSUI:IMSI=123456789012345,MSISDN=345678901234567,PROFILE=1,LMU;
```

A subscription for an LMU subscriber is initiated with IMSI 123456789012345 and MSISDN 345678901234567. The data assigned to the LMU subscriber is defined by the profile 1. Only the applicable profile data for an LMU subscriber is provided.

#### 5.21.1.1.1 HGSUI Parameters

The following table contains the parameters for the HGSUI command.

*Table 79 HGSUI Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
lmu	-	Location Measurement Unit (LMU)
msisdn	Digit string 5-15 digits. Each digit is 0-9	Mobile Subscriber ISDN Number
profile	Integer 0-8192	Subscriber profile
zoneid	Integer 0-65535	This attribute indicates the geographical area the MultiSC or the association belongs to.
rid	Integer 0-31	Region ID for the multi-region support

### 5.21.1.2 HGSUI Printout

This section lists all HGSUI Printouts.

#### 5.21.1.2.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type





#### 5.21.1.2.2 Answer Printout

This command has no answer printouts.

#### 5.21.1.2.3 Result Printout

This command has no result printouts.

### 5.21.2 Home Location Register, Subscription, End (HGSUE)

This command ends the subscription of an MS or an LMU subscriber.

This command is always capable of removing a HLR subscriber, even if a previous HGSUI or HGSUE command has failed.

#### 5.21.2.1 HGSUE Command Description

```
HGSUE:MSISDN=msisdn;
```

#### Example of an HGSUE Command

```
HGSUE:MSISDN=123456789012345;
```

The subscription for MS with MSISDN 123456789012345 is ended.

#### 5.21.2.1.1 HGSUE Parameters

The following table contains the parameters for the HGSUE command.

*Table 80 HGSUE Parameters*

Parameter	Type	Description
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number

#### 5.21.2.2 HGSUE Printout

This section lists all HGSUE printouts.

#### 5.21.2.2.1 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED  
fault type
```



#### 5.21.2.2.2 Answer Printout

This command has no answer printouts.

#### 5.21.2.2.3 Result Printout

This command has no result printouts.

### 5.21.3 Home Location Register, Subscription, Print (HGSUP)

This command initiates the printout HLR SUBSCRIPTION DATA.

Deviations:

- `MSISDN` and `IMSI` can only accept one value, not multiple.
- Parameter `CONNECTED` is not supported.

#### 5.21.3.1 HGSUP Command Description

$$\text{HGSUP:} + \left[ \begin{array}{l} \text{IMSI=imsi} \\ \text{MSISDN=msisdn} \end{array} \right] + ;$$

#### Example of an HGSUP Command

```
HGSUP:IMSI=123456789012345;
```

The subscription data for `IMSI 123456789012345` is printed.

#### 5.21.3.2 HGSUP Parameters

The following table contains the parameters for the HGSUP command.

*Table 81 HGSUP Parameters*

Parameter	Type	Description
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number

#### 5.21.3.3 HGSUP Printout

This section lists all HGSUP printouts.



### 5.21.3.3.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

### 5.21.3.3.2 Answer Printout

#### HLR SUBSCRIPTION DATA

Deviations:

- `FAULT INTERRUPT` is not supported

#### HLR SUBSCRIBER DATA

```
MSISDN          IMSI          STATE          AUTHD
[msisdn]         [imsi]          state          [authd]

[NONE]

END
```

The following table contains information about the parameters in the HGSUP answer printout:

**Table 82** *HGSUP Answer Printout Parameters*

Parameter	Type	Description
authd	String with one of the following values: <ul style="list-style-type: none"> <li>• AVAILABLE</li> <li>• NO IMSI IN AUC</li> <li>• NO ACCESS TO AUC</li> </ul>	Authentication data <sup>(1)</sup>
imsi	Digit string 6-15 digits. Each digit is 0-9.	International Mobile Subscriber Identity
msisdn	Digit string 5-15 digits. Each digit is 0-9.	Mobile Subscriber ISDN Number
state	One of the following strings: <ul style="list-style-type: none"> <li>• NOT CONNECTED</li> <li>• CONNECTED</li> <li>• ADDITIONAL</li> </ul>	State corresponding to the subscription or number
zoneid	Integer 0-65535	This attribute indicates the geographical area the MultiSC or the association belongs to.

<sup>(1)</sup> *AUTHINFO* is only available if subscriber earlier has initiated an Authentication Procedure ("Send Authentication Information" MAP operation has been received for a specific subscriber).



### 5.21.3.3.3 Result Printout

This command has no result printouts.

## 5.22 HGPS: Subscriber Spam SMS Data

This section covers the following MML HLR commands:

- Home Location Register, Subscriber Spam SMS Data, Initiate (HGPSI) (Section 5.22.1 on page 152)
- Home Location Register, Subscriber Spam SMS Data, End (HGPE) (Section 5.22.2 on page 153)
- Home Location Register, Subscriber Spam SMS Data, Print (HGPP) (Section 5.22.3 on page 154)

### 5.22.1 Home Location Register, Subscriber Spam SMS Data, Initiate (HGPSI)

This command initiates a Short Message Service Center (SMSC) address series in the spam Short Message Service (SMS) data for a mobile subscriber in HLR.

#### 5.22.1.1 HGPSI Command Description

```
HGPSI:MSISDN=msisdn,SCADS=scads;
```

Example of an HGPSI command:

```
HGPSI:MSISDN=38050678048,SCADS=45672;
```

The SMSC address series 45672 is initiated in the spam SMS data for the mobile subscriber with MSISDN 38050678048.

#### 5.22.1.2 HGPSI Parameters

The following table contains the parameters for the HGPSI command.

*Table 83 HGPSI Parameters*

Parameter	Type	Description
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
scads	Digit string 1–15 digits. Each digit is 0–9.	Short Message Service Center address series



### 5.22.1.3 HGPSI Printout

This section lists all HGPSI printouts.

#### 5.22.1.3.1 Procedure Printout

EXECUTED

NOT ACCEPTED  
fault type

#### 5.22.1.3.2 Answer Printout

This command has no answer printouts.

#### 5.22.1.3.3 Result Printout

This command has no result printouts.

## 5.22.2 Home Location Register, Subscriber Spam SMS Data, End (HGPSE)

This command ends SMSC address series defined in the spam Short Message Service (SMS) data for a mobile subscriber in HLR.

If parameter *SCADDS* is not present, all the SMSC address series defined in the spam SMS data for the mobile subscriber are ended.

### 5.22.2.1 HGPSE Command Description

HGPSE:MSISDN=msisdn[, SCADDS=scads];

Example of an HGPSE command:

HGPSE:MSISDN=112245;

All the SMSC address series, which are defined in the spam SMS data for the mobile subscriber with MSISDN 112245, are ended.

### 5.22.2.2 HGPSE Parameters

The following table contains the parameters for the HGPSE command.

*Table 84 HGPSE Parameters*

Parameter	Type	Description
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
scadds	Digit string 1–15 digits. Each digit is 0–9.	Short Message Service Center address series



### 5.22.2.3 HGPSE Printout

This section lists all HGPSE printouts.

#### 5.22.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.22.2.3.2 Answer Printout

This command has no answer printouts.

#### 5.22.2.3.3 Result Printout

This command has no result printouts.

### 5.22.3 Home Location Register, Subscriber Spam SMS Data, Print (HGPSP)

This command prints the spam SMS control information for Mobile Terminating (MT) SMS activation status and SMSC address series in the spam SMS data, which is used for a series of connected subscribers with any SMSC address defined.

Result printout HLR SUBSCRIBER SPAM SMS DATA is received.

#### 5.22.3.1 HGPSP Command Description

```
HGPSP:MSISDNS=msisdns;
```

Example of an HGPSP command:

```
HGPSP:MSISDNS=491900000306;
```

The spam control information is printed for the connected subscriber that is defined with MSISDN 491900000306.

#### 5.22.3.2 HGPSP Parameters

The following table contains the parameters for the HGPSP command.

*Table 85 HGPSP Parameters*

Parameter	Type	Description
msisdns	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series



### 5.22.3.3 HGPSP Printout

This section lists all HGPSP printouts.

#### 5.22.3.3.1 Procedure Printout

```
[
  ORDERED
+
  NOT ACCEPTED
  fault type
+
]
```

#### 5.22.3.3.2 Answer Printout

This command has no answer printouts.

#### 5.22.3.3.3 Result Printout

```
HLR SUBSCRIBER SPAM SMS DATA

MSISDN          SMSPAM    SCADDS
msisdn          smspam    scadds

[NONE]

END
```

## 5.23 HGMA: Mobility Management in Triggering Subscription Data Activation

This section covers the following MML HLR commands:

- Home Location Register, Mobility Management IN Triggering Subscription Data Activation, Initiate (HGMAI) (Section 5.23.1 on page 155)
- Home Location Register, Mobility Management IN Triggering Subscription Data Activation, End (HGMAE) (Section 5.23.2 on page 156)

### 5.23.1 Home Location Register, Mobility Management in Triggering Subscription Data Activation, Initiate (HGMAI)

This command initiates the activation of detection points that are defined for a mobile subscriber.

#### 5.23.1.1 HGMAI Command Description

```
HGMAI:MSISDN=msisdn[,DP=dp...];
```



Example of an HGMAI command:

```
HGMAI:MSISDN=778899001122,DP=1;
```

In the example above, the activation of detection point 1, which is used for the mobile subscriber with MSISDN 778899001122, is initiated.

### 5.23.1.2 HGMAI Parameters

The following table contains the parameters for the HGMAI command.

*Table 86 HGMAI Parameters*

Parameter	Type	Description
dp	Integer, 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC)
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number

### 5.23.1.3 HGMAI Printout

This section lists all HGMAI printouts.

#### 5.23.1.3.1 Procedure Printout

```
EXECUTED  
  
NOT ACCEPTED  
fault type
```

#### 5.23.1.3.2 Answer Printout

This command has no answer printouts.

#### 5.23.1.3.3 Result Printout

This command has no result printouts.

## 5.23.2 Home Location Register, Mobility Management in Triggering Subscription Data Activation, End (HGMAE)

This command ends the activation of detection points for a mobile subscriber.

### 5.23.2.1 HGMAE Command Description

```
HGMAE:MSISDN=msisdn[,DP=dp...];
```





Example of an HGMAE command:

```
HGMAE:MSISDN=778899001123,DP=0&1;
```

In the example above, the activation of detection points 0 and 1, which is used for the mobile subscriber with MSISDN 778899001123, is ended.

### 5.23.2.2 HGMAE Parameters

The following table contains the parameters for the HGMAE command.

*Table 87 HGMAE Parameters*

Parameter	Type	Description
dp	Integer, 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC)
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number

### 5.23.2.3 HGMAE Printout

This section lists all HGMAE printouts.

#### 5.23.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.23.2.3.2 Answer Printout

This command has no answer printouts.

#### 5.23.2.3.3 Result Printout

This command has no result printouts.

## 5.24 HGMM: Mobility Management in Triggering Subscription Data

This section covers the following MML HLR commands:

- Home Location Register, Mobility Management IN Triggering Subscription Data, Initiate (HGMMI) (Section 5.24.1 on page 158)

- Home Location Register, Mobility Management IN Triggering Subscription Data, Change (HGMMC) (Section 5.24.2 on page 159)
- Home Location Register, Mobility Management IN Triggering Subscription Data, End (HGME) (Section 5.24.3 on page 160)
- Home Location Register, Mobility Management IN Triggering Subscription Data, Print (HGMP) (Section 5.24.4 on page 161)

## 5.24.1 Home Location Register, Mobility Management IN Triggering Subscription Data, Initiate (HGMMI)

This command defines a detection point associated with a GSM service control function address and a service key for a mobile subscriber.

Only one service key and one GSM service control function address can be associated with each detection point.

### 5.24.1.1 HGMMI Command Description

HGMMI:MSISDN=msisdn,DP=dp,SK=sk,GSA=gsa;

Example of an HGMMI command:

HGMMI:MSISDN=12345678,DP=0,SK=248,GSA=12345678;

The detection point 0, which is associated with service key 248 and the GSM service control function address 12345678, is defined for the mobile subscriber with MSISDN 12345678.

### 5.24.1.2 HGMMI Parameters

The following table contains the parameters for the HGMMI command.

Table 88 HGMMI Parameters

Parameter	Type	Description
dp	Integer 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC) At most two dps can be used for each subscriber.
gsa	Digit string 3–15 digits. Each digit is 0–9.	Global System for Mobile Communication
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
sk	Integer 0–2147483647	Service Key



### 5.24.1.3 HGMMI Printout

This section lists all HGMMI printouts.

#### 5.24.1.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.24.1.3.2 Answer Printout

This command has no answer printouts.

#### 5.24.1.3.3 Result Printout

This command has no result printouts.

## 5.24.2 Home Location Register, Mobility Management IN Triggering Subscription Data, Change (HGMMC)

This command changes the GSM service control function address and the service key, which are associated with a detection point for a mobile subscriber.

Only the data for detection points that are not activated can be changed.

If parameter *sk* is present, the new service key is associated with the specified detection point for the mobile subscriber.

If parameter *GSA* is present, the new GSM service control function address is associated with the specified detection point for the mobile subscriber.

### 5.24.2.1 HGMMC Command Description

```
HGMMC:MSISDN=msisdn,DP=dp+[ ,SK=sk] [ ,GSA=gsa] ;
```

Example of an HGMMC command:

```
HGMMC:MSISDN=12345678,DP=0,SK=250,GSA=55667788;
```

The service key 250 and the GSM service control function address 55667788 are associated with detection point 0, for the mobile subscriber with MSISDN 12345678.



### 5.24.2.2 HGMMC Parameters

The following table contains the parameters for the HGMMC command.

*Table 89 HGMMC Parameters*

Parameter	Type	Description
dp	Integer 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC) At most two dps can be used for each subscriber.
gsa	Digit string 3–15 digits. Each digit is 0–9.	Global System for Mobile Communication
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
sk	Integer 0–2147483647	Service Key

### 5.24.2.3 HGMMC Printout

This section lists all HGMMC printouts.

#### 5.24.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.24.2.3.2 Answer Printout

This command has no answer printouts.

#### 5.24.2.3.3 Result Printout

This command has no result printouts.

### 5.24.3 Home Location Register, Mobility Management IN Triggering Subscription Data, End (HGMME)

This command deletes one or more detection points as well as the associated data for a mobile subscriber.

Only the detection points that are not activated can be removed.

If parameter `dp` is not present, all detection points are removed for the mobile subscriber.

The maximum number of detection points that can be specified in one command is 10.



### 5.24.3.1 HGMME Command Description

```
HGMME:MSISDN=msisdn[,DP=dp...];
```

Example of an HGMME command:

```
HGMME:MSISDN=12345678;
```

All defined detection points and the associated data are removed for the mobile subscriber with MSISDN 12345678.

### 5.24.3.2 HGMME Parameters

The following table contains the parameters for the HGMME command.

*Table 90 HGMME Parameters*

Parameter	Type	Description
dp	Integer 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC) At most two dps can be used for each subscriber.
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number

### 5.24.3.3 HGMME Printout

This section lists all HGMME printouts.

#### 5.24.3.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.24.3.3.2 Answer Printout

This command has no answer printouts.

#### 5.24.3.3.3 Result Printout

This command has no result printouts.

## 5.24.4 Home Location Register, Mobility Management IN Triggering Subscription Data, Print (HGMMP)

This command prints mobility management Intelligent Network (IN) triggering subscription data.



If parameter `ACTIVE` is specified in the command, only the data for the activated detection points is printed.

#### 5.24.4.1 HGMP Command Description

```
HGMP:MSISDN=msisdn[,ACTIVE];
```

Example of an HGMP command:

```
HGMP:MSISDN=12345678,ACTIVE;
```

The mobility management IN triggering subscription data, which is used for activated detection points associated with the mobile subscriber containing MSISDN 12345678, is printed.

#### 5.24.4.2 HGMP Parameters

The following table contains the parameters for the HGMP command.

*Table 91 HGMP Parameters*

Parameter	Type	Description
dpstatus	String <code>ACTIVE</code>	The status of the detection point
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number

#### 5.24.4.3 HGMP Printout

This section lists all HGMP printouts.

##### 5.24.4.3.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

##### 5.24.4.3.2 Answer Printout

```
HLR MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA
MSISDN      DP   SK      GSA      DPSTATUS
msisdn      dp   sk      gsa      [dpstatus]
.           .   .       .       .
.           .   .       .       .
.           .   .       .       .
.           dp   sk      gsa      [dpstatus]
[NONE]
END
```

The following table contains information about the parameters in the HGMP answer printout:



*Table 92 Answer Printout*

Parameter	Type	Description
dp	Integer 0 or 1 0 = DP location updated 1 = DP IMSI detach	Detection point, which can only be set to value 0 or 1 (limitation in UDC)
dpstatus	String ACTIVE	The status of the detection point
gsa	Digit string 3–15 digits. Each digit is 0–9.	Global System for Mobile Communication
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
sk	Integer 0–2147483647	Service key

#### 5.24.4.3.3 Result Printout

This command has no result printouts.

## 5.25 HGTE: Spatial Triggers Data

This section covers the following MML HLR commands:

- Home Location Register, Spatial Triggers Data, Initiate (HGTEI) (Section 5.25.1 on page 163)
- Home Location Register, Spatial Triggers Data, Change (HGTEC) (Section 5.25.2 on page 164)
- Home Location Register, Spatial Triggers Data, End (HGTEE) (Section 5.25.3 on page 165)
- Home Location Register, Spatial Triggers Data, Print (HGTEP) (Section 5.25.4 on page 167)

### 5.25.1 Home Location Register, Spatial Triggers Data, Initiate (HGTEI)

This command initiates the spatial triggers event associated with a GMLC address identifier for a mobile subscriber in the Home Location Register (HLR).

#### 5.25.1.1 HGTEI Command Description

```
HGTEI: + [MSISDN=msisdn] +, STE=ste, GMLCID=gmlcid;
        [IMSI=imsi]
```

Example of an HGTEI command:



HGTEI:MSISDN=491900000306,STE=0,GMLCID=33;

The spatial triggers event 0, associated with the GMLC address with identifier 33, is initiated for the mobile subscriber with MSISDN 491900000306.

### 5.25.1.2 HGTEI Parameters

The following table contains the parameters for the HGTEI command.

*Table 93 HGTEI Parameters*

Parameter	Type	Description
gmlcid	Integer 0–255	The Gateway Mobile Location Center address identifier
imsi	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
ste	Integer 0	Spatial Triggers Event

### 5.25.1.3 HGTEI Printout

This section lists all HGTEI printouts.

#### 5.25.1.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.25.1.3.2 Answer Printout

This command has no answer printouts.

#### 5.25.1.3.3 Result Printout

This command has no result printouts.

## 5.25.2 Home Location Register, Spatial Triggers Data, Change (HGTEC)

This command changes the spatial triggers data for a mobile subscriber in HLR.





### 5.25.2.1 HGTEC Command Description

$$\text{HGTEC:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right] +, \text{STE=ste, GMLCID=gmlcid};$$

Example of an HGTEC command:

```
HGTEC:MSISDN=491900000306,STE=0,GMLCID=34;
```

The GMLC address with identifier 34 is associated with the spatial triggers event 0 that is already defined.

### 5.25.2.2 HGTEC Parameters

The following table contains the parameters for the HGTEC command.

*Table 94 HGTEC Parameters*

Parameter	Type	Description
gmlcid	Integer 0–255	The Gateway Mobile Location Center address identifier
imsi	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
ste	Integer 0	Spatial Triggers Event

### 5.25.2.3 HGTEC Printout

This section lists all HGTEC printouts.

#### 5.25.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 5.25.2.3.2 Answer Printout

This command has no answer printouts.

#### 5.25.2.3.3 Result Printout

This command has no result printouts.



### 5.25.3 Home Location Register, Spatial Triggers Data, End (HGTEE)

This command ends the spatial triggers data defined for a mobile subscriber in the HLR.

#### 5.25.3.1 HGTEE Command Description

$$\text{HGTEE:} \left[ \begin{array}{l} \text{MSISDN=msisdn} \\ \text{IMSI=imsi} \end{array} \right]^+, \text{STE=ste};$$

Example of an HGTEE command:

```
HGTEE:MSISDN=491900000306,STE=0;
```

The spatial triggers data with spatial triggers event 0 is deleted for the mobile subscriber with MSISDN 491900000306.

#### 5.25.3.2 HGTEE Parameters

The following table contains the parameters for the HGTEE command.

*Table 95 HGTEE Parameters*

Parameter	Type	Description
imsi	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
ste	Integer 0	Spatial Triggers Event

#### 5.25.3.3 HGTEE Printout

This section lists all HGTEE printouts.

##### 5.25.3.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 5.25.3.3.2 Answer Printout

This command has no answer printouts.



#### 5.25.3.3.3 Result Printout

This command has no result printouts.

### 5.25.4 Home Location Register, Spatial Triggers Data, Print (HGTEP)

This command prints the spatial triggers data for a connected subscriber with spatial triggers data defined.

#### 5.25.4.1 HGTEP Command Description

$$\text{HGTEP:} \left[ \begin{array}{l} \text{MSISDNS=msisdns} \\ \text{IMSIS=imsi} \end{array} \right]^+ ;$$

Example of an HGTEP command:

```
HGTEP:MSISDNS=491900000306;
```

The subscriber spatial triggers data is printed for the connected subscriber that is defined with MSISDN 491900000306 and spatial triggers data.

#### 5.25.4.2 HGTEP Parameters

The following table contains the parameters for the HGTEP command.

*Table 96 HGTEP Parameters*

Parameter	Type	Description
imsis	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
msisdns	Digit string, 5–15 digits (value range for each digit: 0–9)	MSISDN series

#### 5.25.4.3 HGTEP Printout

This section lists all HGTEP printouts.

##### 5.25.4.3.1 Procedure Printout

```
EXECUTED
```

```
NOT ACCEPTED
fault type
```



### 5.25.4.3.2 Answer Printout

This command has no answer printouts.

### 5.25.4.3.3 Result Printout

HLR SUBSCRIBER SPATIAL TRIGGERS DATA

MSISDN	IMSI	STE	GMLCID	GMLCA
msisdn	imsi	ste	gmlcid	[gmlca]

[NONE]

END

The following table lists information about the parameters in the `HGTEP` result printout.

*Table 97 Result Printout Parameters*

Parameter	Type	Description
gmlca	Digit string 3–15 digits. Each digit is 0–9.	Gateway Mobile Location Center address
gmlcid	Integer 0–255	The Gateway Mobile Location Center address identifier
imsi	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
msisdn	Digit string 5–15 digits. Each digit is 0–9.	Mobile Subscriber ISDN Number
ste	Integer 0	Spatial Triggers Event



## 6 MML Flexible Numbering Register Commands

**Note:** If not explicitly stated otherwise, `Check Printout` does not apply.

For information about the different fault types and error codes, see Section 7 on page 175.

### 6.1 FGNT: Subscriber Number Translation

This section covers the following MML Flexible Numbering Register (FNR) commands:

- Flexible Numbering Register, Subscriber Number Translation, Change (FGNTC) (Section 6.1.1 on page 169)
- Flexible Numbering Register, Subscriber Number Translation, End (FGNTE) (Section 6.1.2 on page 171)
- Flexible Numbering Register, Subscriber Number Translation, Print (FGNTP) (Section 6.1.3 on page 172)

#### 6.1.1 Flexible Numbering Register, Subscriber Number Translation, Change (FGNTC)

This command changes number translations in the FNR.



**Note:** At certain system states, the FGNTC command can result in an `Initiate` or an `End` as shown below. In other cases it will result in a `Modify Replace`.

For FGNTC with NPREFIX:

- FGNTC results in an `Initiate` if the CUDB does not already contain the supplied MSISDN and HLR responds with `STYPE` that **differs** from `HOME(0)`.
- FGNTC results in an `End` if the CUDB do already contain the supplied MSISDN and HLR responds with `STYPE` **equal** to `HOME(0)`.

For FGNTC with ADDRESS:

- FGNTC results in an `Initiate` if the CUDB does not already contain the supplied MSISDN and HLR responds with:
  - `STYPE` **equal** to `HOME(0)`, and `NODEADDR` with a value other than default.

OR

- `STYPE` **equal** to `IMPORTED(1)`.
- FGNTC results in an `End` if the CUDB does already contain the supplied MSISDN and HLR responds with:
  - `STYPE` **equal** to `HOME(0)`, and `NODEADDR` set to default.

Deviations:

- The parameter `IMSI` is not used as part of the provisioning request. It is only supported for backward compatibility reasons in the incoming request.

#### 6.1.1.1

#### FGNTC Command Description

$$\text{FGNTC:MSISDN=msisdn,} \left[ \begin{array}{l} [\text{IMSI=imsi}], \text{ADDRESS=address} \\ \text{NPREFIX=nprefix} \end{array} \right]^+;$$

#### Example of an FGNTC Command

FGNTC:MSISDN=345678901234567,NPREFIX=1612#13;

In the example above, the number translation for MSISDN 345678901234567 is changed to network prefix 1612#13 in the FNR.



### 6.1.1.2 FGNTC Parameters

The following table lists the parameters for the FGNTC command.

*Table 98 FGNTC Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
imsi	Digit string 6–15 digits. Each digit is 0–9.	International Mobile Subscriber Identity
nprefix	Digit string, 1-10 digits, 0-9 or #10-#14 for each digit	Network prefix
address	Digit string, 5-28 digits, 0-9 or #10-#14 for each digit	Network address

### 6.1.1.3 FGNTC Printout

This section lists all FGNTC printouts.

#### 6.1.1.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

#### 6.1.1.3.2 Answer Printout

This command has no answer printouts.

#### 6.1.1.3.3 Result Printout

This command has no result printouts.

## 6.1.2 Flexible Numbering Register, Subscriber Number Translation, End (FGNTE)

This command changes number translations in the FNR.

Deviations:

- Only the parameter `MSISDN` is supported.
- The parameter `ADDRESS` is not supported.

### 6.1.2.1 FGNTE Command Description

```
FGNTE:MSISDN=msisdn;
```



### Example of an FGNTE Command

```
FGNTE:MSISDN=345678901234567;
```

In the example above, the number translation for MSISDN 345678901234567 is deleted from the FNR.

#### 6.1.2.2 FGNTE Parameters

The following table lists the parameter for the FGNTE command.

*Table 99 FGNTE Parameter*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number

#### 6.1.2.3 FGNTE Printout

This section lists all FGNTE printouts.

##### 6.1.2.3.1 Procedure Printout

```
EXECUTED
NOT ACCEPTED
fault type
```

##### 6.1.2.3.2 Answer Printout

This command has no answer printouts.

##### 6.1.2.3.3 Result Printout

This command has no result printouts.

#### 6.1.3 Flexible Numbering Register, Subscriber Number Translation, Print (FGNTP)

This command print the number translations defined in the FNR.

Deviations:

- Only the parameter MSISDN is supported.
- The parameters NPREFIX and IMSITRAN are not supported.





### 6.1.3.1 FGNTTP Command Description

```
FGNTTP:MSISDN=msisdn;
```

#### Example of an FGNTTP Command

```
FGNTTP:MSISDN=345678901234567;
```

In the example above, the number translation in FNR for MSISDN 345678901234567 is printed.

### 6.1.3.2 FGNTTP Parameters

The following table lists the parameter for the FGNTTP command.

*Table 100 FGNTTP Parameter*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number

### 6.1.3.3 FGNTTP Printout

This section lists all FGNTTP printouts.

#### 6.1.3.3.1 Procedure Printout

```
NOT ACCEPTED
fault type
```

#### 6.1.3.3.2 Answer Printout

The answer printout of the FNR subscriber number translation data is shown as follows:

Deviation:

- IMSI, GIMSI, IMSIS, and MSISDNS are not supported
- Only MSISDN is supported
- FAULT INTERRUPT fault type is not supported



```
FNR SUBSCRIBER NUMBER TRANSLATION DATA

NUMBER DATA

MSISDN          SUBTYPE          [SUBCOND]
msisdn          [subtype]        [subcond]

NPREFIX          [ADDRESS]
[nprefix]        [address]

END
```

The following table contains information about the parameters in the FGNTTP answer printout.

*Table 101 FGNTTP Answer Printout FNR Subscriber Number Translation Data Parameters*

Parameter	Type	Description
msisdn	Digit string, 5–15 digits (value range for each digit: 0–9)	Mobile Subscriber ISDN Number
subtype	Enumeration value: <ul style="list-style-type: none"><li>• HOME <sup>(1)</sup></li><li>• IMPORTED: imported from another network</li><li>• EXPORTED: exported to another network</li><li>• OTHER: ported between other networks</li></ul>	Subscriber type
subcond	Enumeration value: <ul style="list-style-type: none"><li>• GSM/WCDMA</li><li>• PSTN/ISDN</li></ul>	Subscriber condition. It applies only for imported Subscribers.
nprefix	Digit string, 1-10 digits, 0-9 or #10-#14 for each digit	Network prefix
address <sup>(2)</sup>	Digit string, 5-28 digits, 0-9 or #10-#14 for each digit	Network address

(1) Only possible if MSISDN belongs to a FAM subscription.

(2) This parameter is returned if MSISDN belongs to a FAM subscription.

#### 6.1.3.3.3

#### Result Printout

The result printout is same as the answer printout in Section 6.1.3.3.2 on page 173.



## 7 Faults or Errors

This section includes all subordinate MML AUC and MML HLR errors that can occur.

**Note:** Not all error codes are supported compared to the old Monolithic HLR interface.

There are four kinds of printouts:

- AnswerPrintout
- ProcedurePrintout
- CheckPrintout
- ResultPrintout

AnswerPrintout and ProcedurePrintouts are fully compliant.

CheckPrintout is not fully compliant and requires a confirmation with ;, otherwise the following fault is printed:

```
INHIBITED
```

ResultPrintout is not fully compliant. If ORDERED is given as a ProcedurePrintout, CTRL-D (EOT) is to be entered to get the ResultPrintout. When CTRL-D (EOT) is entered, the terminal is ceased and the result is printed when the operation is ready. For long running operations this can take several minutes. When the result is printed, press ENTER to release the terminal. When ORDERED is given as a ProcedurePrintout, the following fault is printed until CTRL-D (EOT) is entered:

```
NOT ACCEPTED
FUNCTION BUSY
```

The following fault types are generic for all ProcedurePrintouts:

- FUNCTION BUSY - The function is busy. The command was not accepted due to system busy. Therefore, this fault type is not recorded in processing log.
- FORMAT ERROR - The parameter was incorrectly specified. Detailed information can be displayed in next line.
- UNREASONABLE VALUE - The parameter was specified with an unreasonable value.



- **SYNTAX FAULT** - All commands not following the MML syntax (five characters) and not ended with ;
- **COMMAND UNKNOWN** - The command specified is not an implemented PG MML command.
- **COMMAND NOT AUTHORIZED** - The entered command required higher authority.

## 7.1 MML AUC Errors

This section covers AUC errors that can be sent through UDC HLR/AUC Activation Interface. The error codes can only appear in certain commands. The commands listed in this section can be assumed to be stopping, unless “not stopping” is stated. The following table lists the MML AUC error codes.

*Table 102 MML AUC Error Codes*

Error Code	Error Message	Command
2	KIND NOT DEFINED	<b>AUC Subscription</b> AGSUI
4	A3A8IND NOT SUPPORTED	<b>AUC Subscription</b> AGSUI
7	IMSI ALREADY SUBSCRIBED	<b>AUC Subscription</b> AGSUI
10	KEY DATA OPERATION IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
11	IMSI NOT SUBSCRIBED	<b>AUC Subscription</b> AGSUC AGSUE AGSUP
		<b>Authentication and Key Agreement Algorithm</b> AGAAC AGAAP
13	SUBSCRIPTION OPERATION IN PROGRESS	<b>Authentication and Key Agreement Algorithm</b> AGAAC
15	A4IND NOT SUPPORTED	<b>AUC Subscription</b> AGSUI



Error Code	Error Message	Command
16	KEY DATA CHANGE IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
17	KEY DATA CHANGE PENDING	<b>AUC Subscription</b> AGSUI AGSUC AGSUE AGSUP
20	CUSTOMER KEY OPERATION IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
24	FUNCTIONALITY NOT SUPPORTED BY THIS EXCHANGE	<b>AUC Subscription</b> AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
25	PARAMETER NOT SUPPORTED BY THIS EXCHANGE	<b>AUC Subscription</b> AGSUI
26	PARAMETER VALUE NOT SUPPORTED BY THIS EXCHANGE	<b>AUC Subscription</b> AGSUI AGSUC
27	FSETIND NOT SUPPORTED	<b>AUC Subscription</b> AGSUI AGSUC
30	OP CHANGE IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC AGSUE
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
32	AKA ALGORITHM CHANGE IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC



Error Code	Error Message	Command
33	AKA ALGORITHM CHANGE PENDING	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
39	SUBSCRIPTION DATA CHANGE IN PROGRESS	<b>AUC Subscription</b> AGAAC
40	SUBSCRIPTION DATA CHANGE PENDING	<b>AUC Subscription</b> AGSUI AGSUC AGSUE AGSUP
		<b>Authentication and Key Agreement Algorithm</b> AGAAC AGAAP
41	NO SUBSCRIPTION DATA CHANGE PENDING	<b>AUC Subscription</b> AGSUC
45	BOP CHANGE IN PROGRESS	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
46	IMSI CONNECTED IN HLR	<b>AUC Subscription</b> AGSUE
51	NO WCDMA SUBSCRIBER DEFINED	<b>AUC Subscription</b> AGSUC
52	NO WCDMA SUBSCRIBER DEFINED FOR SPECIFIED FSET	<b>AUC Subscription</b> AGSUC
53	CENTRALIZED USER DATABASE NOT REACHABLE	<b>AUC Subscription</b> AGSUI AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC



Error Code	Error Message	Command
55	THE SUBSCRIBER DEFINED IS NOT WCDMA	<b>AUC Subscription</b> AGSUP
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
56	THE WCDMA SUBSCRIBER DEFINED HAS NOT THE SPECIFIED FSET	<b>Authentication and Key Agreement Algorithm</b> AGAAC
802	COMMAND RESTRICTED DURING DUMP	<b>AUC Subscription</b> AGSUC
		<b>Authentication and Key Agreement Algorithm</b> AGAAC
12006	DATABASE LOCKED FOR BACKUP	<b>AUC Subscription</b> AGSUI AGSUE
12013	OPERATION FAILED, ROLLBACK HAS BEEN PERFORMED SUCCESSFULLY	<b>AUC Subscription</b> AGSUI
12014	OPERATION FAILED, ROLLBACK WAS UNSUCCESSFUL	<b>AUC Subscription</b> AGSUI

## 7.2 MML FNR Errors

This section covers FNR errors. The error codes can only appear in certain commands. The commands listed in this section can be assumed to be stopping, unless “not stopping” is stated. The following table lists the MML FNR error codes.

*Table 103 MML FNR Errors*

Error Code	Error Message	Command
14	MSISDN NOT DEFINED	<b>FNR Subscription</b> FGNTC FGNTE FGNTP
75	FUNCTIONALITY NOT SUPPORTED BY THIS EXCHANGE	<b>FNR Subscription</b> FGNTC FGNTE FGNTP
520	ILLEGAL COMBINATION OF PARAMETER VALUES	<b>FNR Subscription</b> FGNTC



Error Code	Error Message	Command
809	NPREFIX HAS NOT GOT THE PROPER LENGTH	<b>FNR Subscription</b> FGNTC
829	MSISDN DOES NOT BELONG TO OWN COUNTRY	<b>FNR Subscription</b> FGNTC

## 7.3 MML HLR Errors

This section covers HLR errors that can be sent through UDC HLR/AUC Activation Interface. The error codes can only appear in certain commands. The commands listed in this section can be assumed to be stopping, unless “not stopping” is stated. The following table lists the MML HLR error codes.

*Table 104 MML HLR Error Codes*

Error Code	Error Message	Command
1	IMSI ALREADY DEFINED	<b>HLR Subscription</b> HGSUI
		<b>IMSI Changeover</b> HGICI
2	MSISDN ALREADY DEFINED	<b>HLR Subscription</b> HGSUI
		<b>Additional MSISDN</b> HGAMI
6	SUBSCRIBER AUTHENTICATION DATA NOT FOUND	<b>HLR Subscription</b> HGSUI
		<b>IMSI Changeover</b> HGICI





Error Code	Error Message	Command
13	IMSI NOT DEFINED	<b>Subscriber Network Access Mode</b> HGSNC
		<b>Mobile Subscriber Location</b> HGSLR
		<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICI HGICC HGICE HGICP
		<b>Subscriber PDP Context</b> HGPDJ HGPDG HGPDE
		<b>Multiple Subscription</b> HGMSI HGMSC
		<b>Subscriber Message Waiting Data List</b> HGMWP



Error Code	Error Message	Command
14	MSISDN NOT DEFINED	<b>Subscriber Data</b> HGSDC
		<b>Subscriber Network Access Mode</b> HGSNC
		<b>HLR Subscription</b> HGSUE
		<b>Supplementary Service</b> HGSSI HGSSE
		<b>Additional MSISDN</b> HGAMI HGAME
		<b>Mobile Subscriber Location</b> HGSLR
		<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICI HGICC HGICE HGICP
		<b>Subscriber PDP Context</b> HGPDI HGPDC HGPDE
		<b>Multiple Subscription</b> HGMSI HGMSC HGMSE
		<b>Subscriber Location Services Address</b> HGSGI HGSGE



Error Code	Error Message	Command
		<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE
		<b>Subscriber Message Waiting Data List</b> HGMWP
		<b>Closed User Group</b> HGCUI HGCUC HGCUE HGCUP
		<b>Closed User Group Basic Service Group Options</b> HGCSC HGCSP
		<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC HGMME
15	SUBSCRIBER DATA NOT RECOGNIZED	<b>Subscriber Profile</b> HGSPC
		<b>Subscriber Data</b> HGSDC
16	SUPPLEMENTARY SERVICE NOT RECOGNIZED	<b>Supplementary Service</b> HGSSI HGSSE
17	SUPPLEMENTARY SERVICE NOT APPLICABLE	<b>Supplementary Service</b> HGSSI HGSSE
18	SUPPLEMENTARY SERVICE NOT PROVIDED	<b>Supplementary Service</b> HGSSI HGSSE
19	FORWARDED-TO NUMBER RESTRICTED	<b>Supplementary Service</b> HGSSI



Error Code	Error Message	Command
25	PARAMETER NOT APPLICABLE	<b>Supplementary Service</b> HGSSI HGSSE
26	FORWARDED-TO NUMBER MISSING	<b>Supplementary Service</b> HGSSI
27	OPERATION NOT ALLOWED DUE TO INTERACTION	<b>Supplementary Service</b> HGSSI
31	SUBSCRIBER DATA INCLUDED MORE THAN ONCE	<b>Subscriber Profile</b> HGSPC
32	SUBSCRIBER DATA NOT APPLICABLE	<b>Subscriber Profile</b> HGSPC
		<b>Subscriber Data</b> HGSDC
		<b>HLR Subscription</b> HGSUI
33	OPERATION NOT ALLOWED DUE TO CURRENT LOCATION	<b>Supplementary Service</b> HGSSI
41	NO BASIC SERVICE SUBSCRIBED WITHIN SPECIFIED BSG	<b>Supplementary Service</b> HGSSI HGSSE
		<b>Closed User Group</b> HGCUI HGCUC
42	DATE NOT ACCEPTABLE	<b>IMSI Changeover</b> HGICI HGICC
43	BASIC SERVICE GROUP NOT RECOGNIZED	<b>Supplementary Service</b> HGSSI HGSSE
		<b>Closed User Group</b> HGCUI HGCUC
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
		<b>Closed User Group Basic Service Group Options</b> HGCSO



Error Code	Error Message	Command
44	SS NOT APPLICABLE TO SPECIFIED BASIC SERVICE GROUP	<b>Supplementary Service</b> HGSSI HGSSE
46	NO PENDING CHANGEOVER	<b>IMSI Changeover</b> HGICE HGICC
47	SUBSCRIPTION LIMIT OF NUMBERS REACHED	<b>Additional MSISDN</b> HGAMI
48	MSISDN IS NOT AN ADDITIONAL MSISDN	<b>Additional MSISDN</b> HGAME
52	IMSI TYPE INCORRECT	<b>IMSI Changeover</b> HGICI HGICC HGICE
		<b>IMSI Changeover Removal</b> HGIRI
53	MSISDN TYPE INCORRECT	<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICI HGICC HGICE
		<b>HLR Subscription</b> HGSUI
55	BC NOT DEFINED	<b>Additional MSISDN</b> HGAMI
56	BS NOT SUPPORTED	<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
57	BC OUT OF RANGE	<b>Additional MSISDN</b> HGAMI
61	SS NOT APPLICABLE TO ANY SUBSCRIBED BASIC SERVICE	<b>Supplementary Service</b> HGSSI HGSSE
62	SUPPLEMENTARY SERVICE NOT REGISTERED	<b>Supplementary Service</b> HGSSI
63	CHANGEOVER ALREADY INITIATED	<b>IMSI Changeover</b> HGICI



Error Code	Error Message	Command
64	CHANGEOVER NOT INITIATED	<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICC HGICE
65	CHANGEOVER ALREADY EXECUTED	<b>IMSI Changeover</b> HGICC HGICE
66	CHANGEOVER STILL PENDING	<b>IMSI Changeover Removal</b> HGIRI
68	BC REPRESENTS A BS NOT SUPPORTED	<b>Additional MSISDN</b> HGAMI
70	STORAGE SHORTAGE IN CHANGEOVER DATA FILE	<b>IMSI Changeover</b> HGICI
75	FUNCTIONALITY NOT SUPPORTED BY THIS EXCHANGE	<b>Access Point Name</b> HGAPI HGAPC HGAPP HGAPE
		<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
		<b>PDP Context Profile</b> HGPPC
		<b>Subscriber Network Access Mode</b> HGSNC



Error Code	Error Message	Command
		<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE HGS GI HGS GE
		<b>Subscriber Location Services Address</b> HGS GI HGS GE
		<b>Subscriber Packet Data Protocol Context</b> HGPDI HGPDC HGPDE
		<b>Closed User Group</b> HGCUI HGCUC HGCUE
		<b>Closed User Group Basic Service Group Options</b> HGCSC HGCSP
		<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC HGMME
76	CLOSED USER GROUP NOT APPLICABLE TO BSG	<b>Closed User Group</b> HGCUI HGCUC
		<b>Closed User Group Basic Service Group Options</b> HGCSC
77	INDEX ALREADY DEFINED	<b>Closed User Group</b> HGCUI
78	INTERLOCK CODE ALREADY DEFINED	<b>Closed User Group</b> HGCUI



Error Code	Error Message	Command
79	BASIC SERVICE GROUP INCLUDED MORE THAN ONCE	<b>Closed User Group</b> HGCUI
		<b>Closed User Group Basic Service Group Options</b> HGCSC
81	CLOSED USER GROUP NOT APPLICABLE TO ANY BSG	<b>Closed User Group</b> HGCUI
82	MAXIMUM NUMBER OF CLOSED USER GROUPS REACHED	<b>Closed User Group</b> HGCUI
83	BASIC SERVICE GROUP ERASURE NOT ALLOWED	<b>Closed User Group</b> HGCUC
84	INDEX NOT DEFINED	<b>Closed User Group</b> HGCUC HGCUE HGCUP
85	MSISDN NOT DEFINED AS CLOSED USER GROUP MEMBER	<b>Closed User Group</b> HGCUC HGCUE HGCUP
		<b>Closed User Group Basic Service Group Options</b> HGCSC HGCSP
86	BSG NOT DEFINED WITHIN ANY CLOSED USER GROUP	<b>Closed User Group Basic Service Group Options</b> HGCSC
87	BSG NOT DEFINED WITHIN GIVEN PCUG	<b>Closed User Group Basic Service Group Options</b> HGCSC
88	PCUG NOT DEFINED AS INDEX	<b>Closed User Group Basic Service Group Options</b> HGCSC
89	PCUG NOT ALLOWED	<b>Closed User Group Basic Service Group Options</b> HGCSC
90	INTERLOCK CODE NOT DEFINED	<b>Closed User Group</b> HGCUP
96	ZONE CODE SET NOT DEFINED	<b>Subscriber Data</b> HGSDC





Error Code	Error Message	Command
102	ODD NUMBER OF CHARACTERS IN SUBADDRESS	<b>Supplementary Service</b> HGSSI
115	RESTRICTION NOT ALLOWED	<b>Closed User Group</b> HGCUC
116	INDEX ERASURE NOT ALLOWED	<b>Closed User Group</b> HGCUE
117	COLLECTIVE BASIC SERVICE GROUP NOT ALLOWED	<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
		<b>Closed User Group</b> HGCUI HGCUC
		<b>Closed User Group Basic Service Group Options</b> HGCSC
122	PICI-IXC RELATION DOES NOT EXIST	<b>Subscriber Data</b> HGSDC
149	STORAGE SHORTAGE IN GPRS DATA FILE	<b>Subscriber Network Access Mode</b> HGSNC
150	STORAGE SHORTAGE IN PDP CONTEXT DATA FILE	<b>Subscriber PDP Context</b> HGPD1
151	STORAGE SHORTAGE IN FACSIMILE TRANSMISSION DATA FILE	<b>Subscriber Data</b> HGSDC
153	STORAGE SHORTAGE IN DATA CIRCUIT ASYNCHRONOUS DATA FILE	<b>Subscriber Data</b> HGSDC
154	STORAGE SHORTAGE IN DATA CIRCUIT SYNCHRONOUS DATA FILE	<b>Subscriber Data</b> HGSDC
159	BC NOT PERMITTED	<b>Additional MSISDN</b> HGAMI
168	DP ALREADY DEFINED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI
169	DP NOT DEFINED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMC HGMME



Error Code	Error Message	Command
170	DP ACTIVATED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMC HGMME
172	DP VALUE NOT ALLOWED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC HGMME
173	MAXIMUM NUMBER OF DETECTION POINTS EXCEEDED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI
174	TOO MANY DETECTION POINTS SPECIFIED	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMME
175	GSA NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMI HGCMC
		<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC
176	NEW SUBSCRIBER DATA VALUE INCOMPATIBLE	<b>Subscriber Profile</b> HGSPC
182	GENERAL BEARER SERVICE NOT SUBSCRIBED	<b>Subscriber Data</b> HGSDC



Error Code	Error Message	Command
183	PARAMETER NOT SUPPORTED BY THIS EXCHANGE	<b>CAMEL Subscription Data</b> HGCM HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>PDP Context Profile</b> HGPPC
		<b>HLR Subscription</b> HGSUI
		<b>Subscriber PDP Context</b> HGPD HGPD
187	UPDATING CAMEL SUBSCRIPTION DATA IN PROGRESS	<b>CAMEL Subscription Data</b> HGCM HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>CAMEL Triggering Criteria</b> HGCT HGCTE
188	CAMEL SUBSCRIPTION DATA NOT DEFINED	<b>CAMEL Subscription Data</b> HGCME
		<b>CAMEL Extended Information</b> HGCEC
189	PARAMETER VALUE NOT SUPPORTED BY THIS EXCHANGE	<b>Subscriber Profile</b> HGSPC
		<b>CAMEL Subscription Data</b> HGCME
		<b>Subscription Data</b> HGSDC
		<b>Supplementary Service</b> HGSSI
		<b>Multiple Subscription</b> HGMSI HGMS



Error Code	Error Message	Command
190	TCTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
191	OCTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
192	TOO MANY TCTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
193	TCTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMC HGCME
194	OCTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMC HGCME
195	TCTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMC
196	OCTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMC
197	MAXIMUM NUMBER OF TCTDP REACHED	<b>CAMEL Subscription Data</b> HGCMC
198	MAXIMUM NUMBER OF OCTDP REACHED	<b>CAMEL Subscription Data</b> HGCMC
202	TOO MANY OCTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
203	NO ORIGINATING CAMEL SUBSCRIPTION DEFINED	<b>CAMEL Extended Information</b> HGCEC
204	NO TERMINATING CAMEL SUBSCRIPTION DEFINED	<b>CAMEL Extended Information</b> HGCEC
207	BS2G FOR BS2F NOT DEFINED IN THE PROFILE	<b>Subscriber Profile</b> HGSPC



Error Code	Error Message	Command
208	BS3G FOR BS3F NOT DEFINED IN THE PROFILE	<b>Subscriber Profile</b> HGSPC
209	APN IDENTIFIER IN USE	<b>Access Point Name</b> HGAPI
210	APN NOT VALID	<b>Access Point Name</b> HGAPI HGAPC HGAPE HGAPP
211	APN NOT DEFINED	<b>Access Point Name</b> HGAPC HGAPE HGAPP
		<b>PDP Context Profile</b> HGPPC
		<b>Subscriber PDP Context</b> HGPDJ HGPDC
212	APN IN USE	<b>Access Point Name</b> HGAPE
214	APN ALREADY DEFINED	<b>Access Point Name</b> HGAPC HGAPI
215	MAXIMUM NUMBER OF SUBSCRIBER PDP CONTEXT REACHED	<b>Subscriber PDP Context</b> HGPDJ
216	PDP CONTEXT ALREADY DEFINED	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber PDP Context</b> HGPDJ HGPDC
217	PDP CONTEXT WITH NON SUBSCRIBED APN ALREADY DEFINED	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber PDP Context</b> HGPDJ HGPDC



Error Code	Error Message	Command
219	PDP CONTEXT IDENTIFIER INCLUDED MORE THAN ONCE	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber Packet Data Protocol Context</b> HGPDE
220	SUBSCRIBER NETWORK ACCESS MODE HAS ALREADY THAT VALUE	<b>Subscriber Network Access Mode</b> HGSNC
221	SUBSCRIBER DATA INCOMPATIBLE WITH STORED SUBSCRIBER DATA	<b>Subscriber Profile</b> HGSPC
		<b>Subscriber Data</b> HGSDC
222	PDP CONTEXT NOT DEFINED	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber PDP Context</b> HGPDC HGPDE
242	STORAGE SHORTAGE IN SUBADDRESS DATA FILE FOR SPEECH	<b>Supplementary Service</b> HGSSI
243	STORAGE SHORTAGE IN SUBADDRESS DATA FILE FOR DATA CIRCUIT ASYNCHRONOUS	<b>Supplementary Service</b> HGSSI
244	STORAGE SHORTAGE IN SUBADDRESS DATA FILE FOR DATA CIRCUIT SYNCHRONOUS	<b>Supplementary Service</b> HGSSI
245	STORAGE SHORTAGE IN SUBADDRESS DATA FILE FOR FACSIMILE	<b>Supplementary Service</b> HGSSI
246	STORAGE SHORTAGE IN SUBADDRESS DATA FILE FOR AUXILIARY SPEECH	<b>Supplementary Service</b> HGSSI
259	OFA VALUE NOT ALLOWED	<b>Supplementary Service</b> HGSSI
260	STORAGE SHORTAGE IN ORIGINATING CAMEL PHASE 2 DATA FILE	<b>CAMEL Subscription Data</b> HGCMI
261	STORAGE SHORTAGE IN TERMINATING CAMEL PHASE 2 DATA FILE	<b>CAMEL Subscription Data</b> HGCMI
263	LAST OCTDP REMOVAL NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCME
265	STORAGE SHORTAGE IN BSG FOR AUXILIARY SPEECH SERVICES DATA FILE	<b>Additional MSISDN</b> HGAMI



Error Code	Error Message	Command
267	STORAGE SHORTAGE IN ORIGINATING CAMEL PHASE 1 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
268	STORAGE SHORTAGE IN TERMINATING CAMEL PHASE 1 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
271	STORAGE SHORTAGE IN GPRS CAMEL PHASE 3 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
272	GPRSTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
273	MAXIMUM NUMBER OF GPRSTDP REACHED	<b>CAMEL Subscription Data</b> HGCMi
274	I NOT APPLICABLE FOR THIS TYPE OF TDP	<b>CAMEL Subscription Data</b> HGCMC
275	CCH VALUE NOT ALLOWED FOR THIS TYPE OF TDP	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
276	GPRSTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
277	GPRSTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
278	TOO MANY GPRSTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
279	OPERATION NOT APPLICABLE TO AN LMU SUBSCRIBER	<b>Additional MSISDN</b> HGAMI
		<b>Subscriber Location Services Address</b> HGSGI
		<b>Subscriber Location Services Data</b> HGLDI
280	STORAGE SHORTAGE IN LCS DATA FILE	<b>Subscriber Location Services Address</b> HGSGI
		<b>Subscriber Location Services Data</b> HGLDI



Error Code	Error Message	Command
283	NO SUBSCRIBER LCS DATA DEFINED	<b>Subscriber Location Services Data</b> HGLDE
284	NO SUBSCRIBER LCS PRIVACY CLASSES DEFINED	<b>Subscriber Location Services Data</b> HGLDE
285	NO SUBSCRIBER LCS MO CLASSES DEFINED	<b>Subscriber Location Services Data</b> HGLDE
286	SUBSCRIBER LCS DATA NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC
287	NO SUBSCRIBER GMLC ADDRESSES DEFINED	<b>Subscriber Location Services Address</b> HGSGE
291	SUBSCRIBER LCS PRIVACY CLASS ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
292	SUBSCRIBER LCS MO CLASS ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
293	INTERNAL IDENTITY ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
295	CALL UNRELATED LCS CLASS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE
296	SUBSCRIBER LCS PRIVACY CLASS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDE
297	SUBSCRIBER LCS MO CLASS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDE
299	INTERNAL IDENTITY NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDE
301	MAXIMUM NUMBER OF SUBSCRIBER GMLC ADDRESSES EXCEEDED	<b>Subscriber Location Services Address</b> HGSGI
302	SUBSCRIBER GMLC ADDRESS ALREADY DEFINED	<b>Subscriber Location Services Address</b> HGSGI





Error Code	Error Message	Command
303	SUBSCRIBER GMLC ADDRESS NOT DEFINED	<b>Subscriber Location Services Address</b> HGSGE
304	STORAGE SHORTAGE IN ORIGINATING SMS CAMEL DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
305	OSMSTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
306	MAXIMUM NUMBER OF OSMSTDP REACHED	<b>CAMEL Subscription Data</b> HGCMi
307	OSMSTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
308	OSMSTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
309	TOO MANY OSMSTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
314	EXTENDED QOS NOT DEFINED	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber Packet Data Protocol Context</b> HGPDi HGPDC
315	PDP TYPE INCOMPATIBLE WITH EXTENDED QOS	<b>PDP Context Profile</b> HGPPC
		<b>Subscriber PDP Context</b> HGPDi HGPDC
316	STATIC ADDRESSING NOT ALLOWED FOR PDP CONTEXT TYPE	<b>Subscriber PDP Context</b> HGPDi HGPDC
317	STORAGE SHORTAGE IN APN DATA FILE	<b>Access Point Name</b> HGAPI
318	APN IDENTIFIER OUT OF RANGE	<b>Access Point Name</b> HGAPC HGAPI



Error Code	Error Message	Command
324	CALL RELATED LCS CLASS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE
325	TSMSTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
326	TSMSTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
327	MAXIMUM NUMBER OF TSMSTDP REACHED	<b>CAMEL Subscription Data</b> HGCMi
328	STORAGE SHORTAGE IN TERMINATING SMS CAMEL DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
329	TOO MANY TSMSTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
330	TSMSTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
331	SERVICE KEY ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
332	MMTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMi HGCME
333	MMTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
334	MAXIMUM NUMBER OF MMTDP REACHED	<b>CAMEL Subscription Data</b> HGCMi
335	STORAGE SHORTAGE IN MOBILITY MANAGEMENT CAMEL DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
336	GSA NOT SPECIFIED	<b>CAMEL Subscription Data</b> HGCMi
337	SERVICE KEY NOT SPECIFIED	<b>CAMEL Subscription Data</b> HGCMi
338	GSA ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi



Error Code	Error Message	Command
339	MMTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCME
340	DIALNUM ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
341	TOO MANY MMTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCMi HGCME
342	DSTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
344	STORAGE SHORTAGE IN DIALLED SERVICES CAMEL DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
345	DSTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
349	MATCH TYPE NOT DEFINED	<b>CAMEL Triggering Criteria</b> HGCTi
350	MATCH TYPE ALREADY DEFINED	<b>CAMEL Triggering Criteria</b> HGCTi
351	TOO MANY DESTINATION NUMBERS GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTi
352	DESTINATION NUMBER ALREADY GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTi
353	DESTINATION NUMBER ALREADY DEFINED	<b>CAMEL Triggering Criteria</b> HGCTi
354	MAXIMUM NUMBER OF DESTINATION NUMBERS REACHED	<b>CAMEL Triggering Criteria</b> HGCTi
355	TOO MANY DESTINATION NUMBER LENGTHS GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTi
356	DESTINATION NUMBER LENGTH ALREADY GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTi
357	DESTINATION NUMBER LENGTH ALREADY DEFINED	<b>CAMEL Triggering Criteria</b> HGCTi
358	MAXIMUM NUMBER OF DESTINATION NUMBER LENGTHS REACHED	<b>CAMEL Triggering Criteria</b> HGCTi
359	TOO MANY TRIGGERING BASIC SERVICES GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTi



Error Code	Error Message	Command
360	TRIGGERING BASIC SERVICE ALREADY GIVEN IN COMMAND	<b>CAMEL Triggering Criteria</b> HGCTI
361	TRIGGERING BASIC SERVICE ALREADY DEFINED	<b>CAMEL Triggering Criteria</b> HGCTI
362	TRIGGERING BASIC SERVICE NOT ALLOWED	<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
363	MAXIMUM NUMBER OF TRIGGERING BASIC SERVICES REACHED	<b>CAMEL Triggering Criteria</b> HGCTI
364	STORAGE SHORTAGE IN CAMEL TCTDP12 CRITERIA DATA FILE	<b>CAMEL Triggering Criteria</b> HGCTI
365	STORAGE SHORTAGE IN CAMEL OCTDP2 CRITERIA DATA FILE	<b>CAMEL Triggering Criteria</b> HGCTI
366	FORWARDING TRIGGERING CRITERIA ALREADY DEFINED	<b>CAMEL Triggering Criteria</b> HGCTI
367	DEH NOT APPLICABLE FOR THIS TYPE OF TDP	<b>CAMEL Subscription Data</b> HGCMC
368	TRIGGERING CRITERIA DATA NOT DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
369	DESTINATION NUMBER NOT DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
370	DESTINATION NUMBER LENGTH NOT DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
371	FORWARDING TRIGGERING CRITERIA NOT DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
372	NO TRIGGERING BASIC SERVICE DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
373	BS NOT DEFINED AS TRIGGERING BASIC SERVICE	<b>CAMEL Triggering Criteria</b> HGCTE
374	BSG NOT DEFINED AS TRIGGERING BASIC SERVICE	<b>CAMEL Triggering Criteria</b> HGCTE
375	MAXIMUM NUMBER OF SUBSCRIBER CALL RELATED EXTERNAL IDENTITIES REACHED	<b>Subscriber Location Services Data</b> HGLDI
376	MAXIMUM NUMBER OF SUBSCRIBER CALL UNRELATED EXTERNAL IDENTITIES REACHED	<b>Subscriber Location Services Data</b> HGLDI



Error Code	Error Message	Command
377	CALL RELATED EXTERNAL ADDRESS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
378	CALL UNRELATED EXTERNAL ADDRESS NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
379	CALL RELATED EXTERNAL ADDRESS ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
380	CALL UNRELATED EXTERNAL ADDRESS ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
381	CALL RELATED EXTERNAL ADDRESS GMLC RESTRICTION NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
382	CALL UNRELATED EXTERNAL ADDRESS GMLC RESTRICTION NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
383	NAM VALUE NOT ALLOWED DUE TO FUNCTIONALITY NOT SUPPORTED	<b>HLR Subscription</b> HGSUI HGSNC
385	STORAGE SHORTAGE IN CALL UNRELATED EXTERNAL ADDRESS DATA FILE	<b>Subscriber Location Services Data</b> HGLDI
386	STORAGE SHORTAGE IN CALL RELATED EXTERNAL ADDRESS DATA FILE	<b>Subscriber Location Services Data</b> HGLDI
387	INTERNAL IDENTITY ALREADY GIVEN IN COMMAND	<b>Subscriber Location Services Data</b> HGLDI HGLDE
388	SUBSCRIBER LCS MO CLASS ALREADY GIVEN IN COMMAND	<b>Subscriber Location Services Data</b> HGLDI HGLDE
389	STORAGE SHORTAGE IN IPV6 ADDRESS DATA FILE	<b>Subscriber PDP Context</b> HGPDI HGPDC



Error Code	Error Message	Command
390	STORAGE SHORTAGE IN EXTERNAL ADDRESS DATA FILE	<b>Subscriber Location Services Data</b> HGLDI
391	CCH VALUE NOT ALLOWED FOR THIS TDP VALUE	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
392	VTTDP ALREADY DEFINED	<b>CAMEL Subscription Data</b> HGCMi
393	VTTDP VALUE NOT ALLOWED	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
394	STORAGE SHORTAGE IN ORIGINATING CAMEL PHASE 3 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
395	STORAGE SHORTAGE IN TERMINATING CAMEL PHASE 3 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
396	STORAGE SHORTAGE IN VMSC TERMINATING CAMEL PHASE 3 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
397	VTTDP NOT DEFINED	<b>CAMEL Subscription Data</b> HGCMC HGCME
398	TOO MANY VTTDP SPECIFIED	<b>CAMEL Subscription Data</b> HGCME
399	MAXIMUM NUMBER OF VTTDP REACHED	<b>CAMEL Subscription Data</b> HGCMi
400	TRIGGER DETECTION POINT INCLUDED MORE THAN ONCE	<b>CAMEL Subscription Data</b> HGCMC HGCME HGCMi
411	NO MMTDP DEFINED	<b>CAMEL Subscription Data</b> HGCMC
413	NO VALID ORIGINATING CAMEL SUBSCRIPTION DEFINED	<b>CAMEL Extended Information</b> HGCEC
415	SUBSCRIBER GMLC ADDRESS ALREADY GIVEN IN COMMAND	<b>Subscriber Location Services Address</b> HGSgi HGSge



Error Code	Error Message	Command
417	NO DESTINATION NUMBER DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
418	NO DESTINATION NUMBER LENGTH DEFINED	<b>CAMEL Triggering Criteria</b> HGCTE
419	STORAGE SHORTAGE IN EXTERNAL ADDRESS ANALYSIS FILE	<b>Subscriber Location Services Data</b> HGLDI
424	SUBSCRIBER SERVICE TYPE ALREADY DEFINED	<b>Subscriber Location Services Data</b> HGLDI
426	TOO MANY SERVICE TYPES SPECIFIED FOR THE SUBSCRIBER	<b>Subscriber Location Services Data</b> HGLDI
427	SUBSCRIBER SERVICE TYPE ALREADY GIVEN IN COMMAND	<b>Subscriber Location Services Data</b> HGLDI
428	NO SUBSCRIBER SERVICE TYPES DEFINED	<b>Subscriber Location Services Data</b> HGLDE
429	SUBSCRIBER SERVICE TYPE NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
430	SERVICE TYPE GMLC RESTRICTION NOT DEFINED	<b>Subscriber Location Services Data</b> HGLDC HGLDE
436	NO SUBSCRIBER INTERNAL IDENTITIES DEFINED	<b>Subscriber Location Services Data</b> HGLDE
437	PDP CONTEXT IDENTIFIER IN USE	<b>Subscriber PDP Context</b> HGPDI
438	PDP ADDRESS INCOMPATIBLE WITH PDP TYPE	<b>Subscriber Packet Data Protocol Context</b> HGPDC
439	LAST PDP CONTEXT REMOVAL NOT ALLOWED	<b>PDP Context Profile</b> HGPPC
441	UPDATING OF PDP CONTEXT PROFILE IN PROGRESS	<b>PDP Context Profile</b> HGPPC
442	EXTENDED QOS NOT SPECIFIED	<b>PDP Context Profile</b> HGPPC



Error Code	Error Message	Command
443	CHARGING CHARACTERISTICS ERASURE NOT ALLOWED	<b>PDP Context Profile</b> HGPPC
446	FNUM VALUE NOT ALLOWED	<b>Supplementary Service</b> HGSSI
456	SUBSCRIPTION BELONGS TO A MULTIPLE SUBSCRIPTION	<b>HLR Subscription</b> HGSUE
		<b>Multiple Subscription</b> HGMSI HGMSC HGMSE
457	IMSI CORRESPONDS TO MASTER SUBSCRIPTION	<b>Multiple Subscription</b> HGMSI HGMSC
461	STORAGE SHORTAGE IN MULTIPLE SUBSCRIPTION DATA FILE	<b>Multiple Subscription</b> HGMSI
462	SUBSCRIPTION IS NOT A MASTER SUBSCRIPTION	<b>Multiple Subscription</b> HGMSC HGMSE
463	SUBSCRIPTION DOES NOT BELONG TO THE MULTIPLE SUBSCRIPTION	<b>Multiple Subscription</b> HGMSC HGMSE
464	MAXIMUM NUMBER OF SUBSCRIPTIONS IN MULTIPLE SUBSCRIPTION EXCEEDED	<b>Multiple Subscription</b> HGMSC
465	MINIMUM NUMBER OF SUBSCRIPTIONS IN MULTIPLE SUBSCRIPTION EXCEEDED	<b>Multiple Subscription</b> HGMSC
466	CHANGE OF ACTIVE SUBSCRIPTION NOT ALLOWED	<b>Multiple Subscription</b> HGMSC
478	LCS ADDRESS NOT DEFINED	<b>Subscriber Location Services Address</b> HGSGI
479	SUBSCRIBER HAS A HGMLC ADDRESS ALREADY DEFINED	<b>Subscriber Location Services Address</b> HGSGI
480	SUBSCRIBER HAS A PPR ADDRESS ALREADY DEFINED	<b>Subscriber Location Services Address</b> HGSGI
481	NO SUBSCRIBER HGMLC ADDRESS DEFINED	<b>Subscriber Location Services Address</b> HGSGE





Error Code	Error Message	Command
482	NO SUBSCRIBER PPR ADDRESS DEFINED	<b>Subscriber Location Services Address</b> HGSGE
485	STORAGE SHORTAGE IN ORIGINATING CAMEL PHASE 4 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
486	STORAGE SHORTAGE IN TERMINATING CAMEL PHASE 4 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
487	STORAGE SHORTAGE IN VMSC TERMINATING CAMEL PHASE 4 DATA FILE	<b>CAMEL Subscription Data</b> HGCMi
489	FNUM VALUE INCOMPATIBLE WITH OFA VALUE	<b>Supplementary Service</b> HGSSI
520	ILLEGAL COMBINATION OF PARAMETER VALUES	<b>HLR Subscription</b> HGSUI
		<b>HLR Subscriber Data</b> HGSDC



Error Code	Error Message	Command
534	CENTRALIZED USER DATABASE NOT REACHABLE	<b>CAMEL Subscription Data</b> HGCM1 HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
		<b>PDP Context Profile</b> HGPPC
		<b>Subscriber Data</b> HGSDC
		<b>Subscriber Network Access Mode</b> HGSNC
		<b>HLR Subscription</b> HGSUI HGSUE
		<b>Supplementary Service</b> HGSSI HGSSE
		<b>Additional MSISDN</b> HGAMI HGAME
		<b>Mobile Subscriber Location</b> HGSLR
		<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICI HGICC HGICE



Error Code	Error Message	Command
		<b>Subscriber PDP Context</b> HGPDI HGPDC HGPDE
		<b>Multiple Subscription</b> HGMSI HGMSC HGMSE
		<b>Subscriber Location Services Address</b> HGS GI HGS GE
		<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE
		<b>Closed User Group</b> HGCUI HGCUC HGCUE
		<b>Closed User Group Basic Service Group Options</b> HGCSC
		<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC HGMME



Error Code	Error Message	Command
535	RESOURCE LIMITATION	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>CAMEL Triggering Criteria</b> HGCTi HGCTE
		<b>PDP Context Profile</b> HGPPC
		<b>Subscriber Data</b> HGSDC
		<b>Subscriber Network Access Mode</b> HGSNC
		<b>HLR Subscription</b> HGSUI HGSUE
		<b>Supplementary Service</b> HGSSI HGSSE
		<b>Additional MSISDN</b> HGAMI HGAME
		<b>Mobile Subscriber Location</b> HGSLR
		<b>IMSI Changeover Removal</b> HGIRI
		<b>IMSI Changeover</b> HGICI HGICC HGICE



Error Code	Error Message	Command
		<b>Subscriber PDP Context</b> HGPDI HGPDC HGPDE
		<b>Multiple Subscription</b> HGMSI HGMSC HGMSE
		<b>Subscriber Location Services Address</b> HGS GI HGS GE
		<b>Subscriber Location Services Data</b> HGLDI HGLDC HGLDE
		<b>Closed User Group</b> HGCUI HGCUC HGCUE
		<b>Closed User Group Basic Service Group Options</b> HGCSC
		<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI HGMMC HGMME
537	STORAGE SHORTAGE IN ADDITIONAL MSISDN DATA FILES	<b>Additional MSISDN</b> HGAMI
538	STORAGE SHORTAGE IN DETECTION POINT DATA FILE	<b>MOBILITY MANAGEMENT IN TRIGGERING SUBSCRIPTION DATA</b> HGMMI
539	STORAGE SHORTAGE IN CLOSED USER GROUP DATA FILES	<b>Closed User Group</b> HGCUI



Error Code	Error Message	Command
542	PROFILE DOES NOT EXIST IN CENTRALIZED USER DATABASE	<b>CAMEL Subscription Data</b> HGCMi HGCMC HGCME
		<b>CAMEL Extended Information</b> HGCEC
		<b>CAMEL Triggering Criteria</b> HGCTI HGCTE
		<b>PDP Context Profile</b> HGPPC HGPPP
589	TOO MANY SUBSCRIPTIONS WITHIN MULTIPLE IMSI SUBSCRIPTION	<b>Multiple Subscription</b> HGMSE
597	INCOMPATIBLE PDPTY AND EPDPIND VALUES	<b>HLR Subscriber Packet Data Protocol Context</b> HGPDC
598	INCOMPATIBLE PDPADD AND EPDPADD VALUES	<b>HLR Subscriber Packet Data Protocol Context</b> HGPDC
599	INCOMPATIBLE EPDPADD AND EPDPIND VALUES	<b>HLR Subscriber Packet Data Protocol Context</b> HGPDC
600	SUBSCRIBER NOT DEFINED IN THE REGION	<b>HLR Subscriber Data</b> HGSDC
804	CHANGEOVER NOT ALLOWED	<b>IMSI Changeover</b> HGICI
806	GSMSCF PROFILE NOT DEFINED	<b>HLR Subscription</b> HGSUI <b>HLR Subscriber Data</b> HGSDC



Error Code	Error Message	Command
12006	DATABASE LOCKED FOR BACKUP	<b>Additional MSISDN</b> HGAMI HGAME
		<b>IMSI Changeover</b> HGICI HGICE
		<b>IMSI Changeover Removal</b> HGIRI
		<b>Multiple Subscription</b> HGMSI HGMSC HGMSE
		<b>Subscriber Network Access Mode</b> HGSNC
		<b>Subscription</b> HGSUI HGSUE
12013	OPERATION FAILED, ROLLBACK HAS BEEN PERFORMED SUCCESSFULLY	<b>HLR Subscription</b> HGSUI <b>Additional MSISDN</b> HGAMI
12014	OPERATION FAILED, ROLLBACK WAS UNSUCCESSFUL	<b>HLR Subscription</b> HGSUI <b>Additional MSISDN</b> HGAMI







## Reference List

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- [2] *Glossary of Terms and Acronyms*, 0033-CSH 109 628 Uen
- [3] *System Administrators Guide for Native Deployment*, 1/1543-CSH 109 628 Uen
- [4] *System Administrators Guide for Virtual and Cloud Deployment*, 3/1543-CSH 109 628 Uen
- [5] *Layered HLR Common Profile Data over CAI3G*, 8/155 19-CSH 109 628 Uen
- [6] *HLR Subscriber Data Type Definitions*, 1/198 18-CSH 109 628 Uen
- [7] *Function Specification Resource Activation*, 3/155 17-CSH 109 628 Uen
- [8] *Function Specification Identity Changeover for Layered Applications*, 14/155 17-CSH 109 628 Uen
- [9] *Layered Identity Changeover Provisioning over CAI3G*, 27/155 19-CSH 109 628 Uen

### Protocol Specifications

- [10] *TELNET Protocol Specification*, <http://www.faqs.org/rfcs/rfc854.html>, RFC 854 ISI May 1983 J.Postel and J. Reynolds
- [11] *SSH Protocol Specification*, <http://www.ietf.org/rfc/rfc4251.txt>