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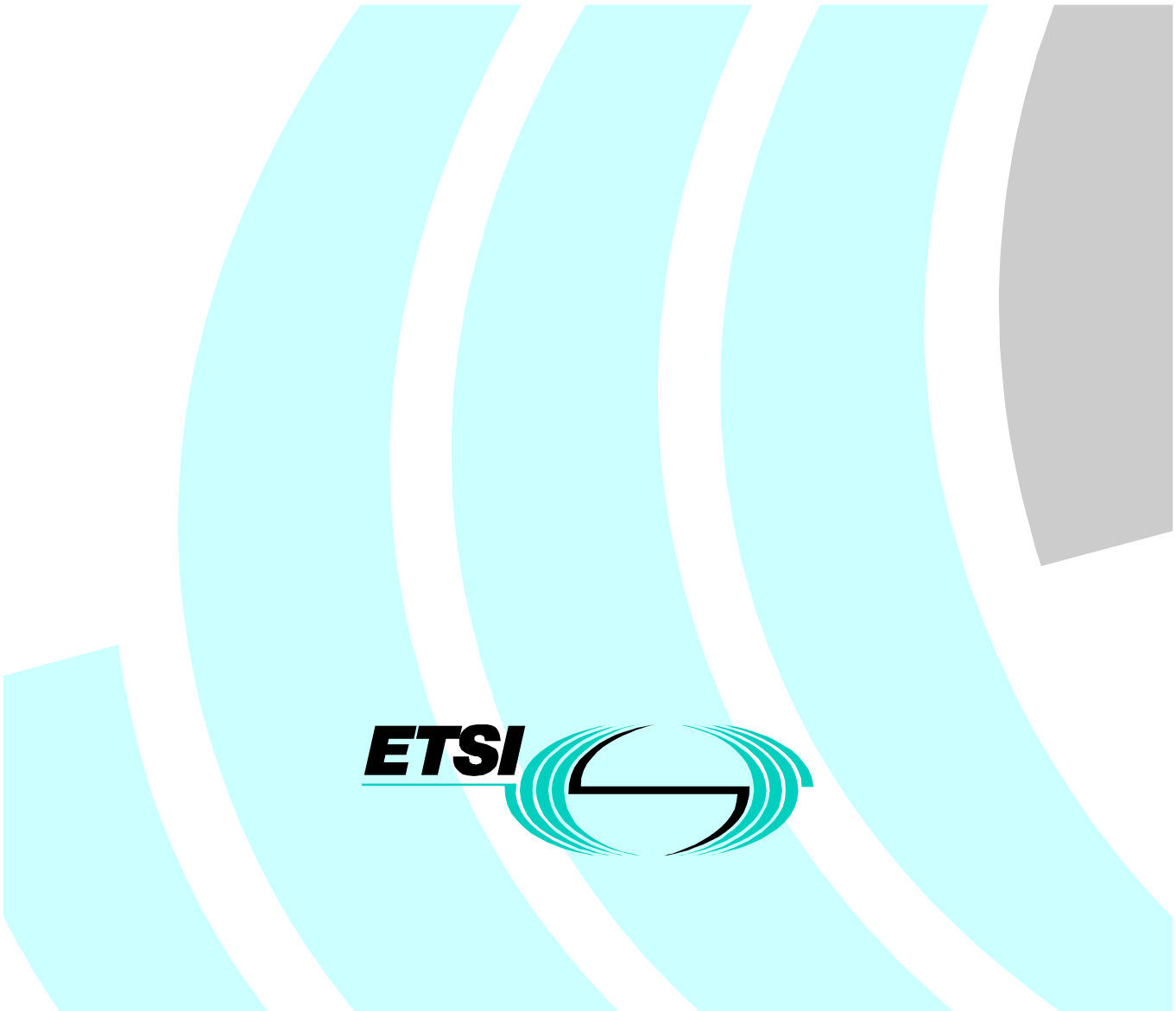
Technical Specification

Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 5: SMS point-to-point and cell broadcast



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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is based on DECT Common Interface (CI) specification EN 300 175, parts 1 [1] to 8 [8] to enable DECT terminals to interwork in the public and private environment with DECT systems which are connected to a UMTS core infrastructure.

In addition, the present document is based on the DECT Generic Access Profile (GAP), EN 300 444 [15] to enable the same DECT/UMTS terminal to interwork with a DECT FP complying to the GAP requirements, irrespective of whether this FP provides residential, business or public access services. General attachment requirements and speech attachment requirements are based on EN 301 406 [16].

The present document is part 5 of a multi-part deliverable covering Digital Enhanced Cordless Telecommnications (DECT); DECT/UMTS Interworking Profile (IWP), as identified below:

Part 1: "General description and overview";

Part 2: "CN-FP interworking";

Part 3: "3,1 KHz speech service";

Part 4: "Supplementary services";

Part 5: "SMS point-to-point and cell broadcast";

Part 6: "Packet switched data".

The present document defines a general purpose, but strict, mobility profile in terms of features, procedures, data structures, information elements and fields within the information elements at the DECT air interface in order to achieve full inter operability between equipment, i.e. DECT systems and terminals, which fulfil the requirements of the present document. The present document also fulfils the minimum requirements of the GAP enabling backwards compatibility with the respective equipment.

Further details on the DECT system may be found in TR 101 178 [17], ETR 043 [18] and EN 300 176 [19].

1 Scope

The present document specifies the Digital Enhanced Cordless Telecommunications (DECT) access protocols and Fixed Part (FP) and Portable Part (PP) interworking/mappings necessary to ensure that the Universal Mobile Telecommunication System (UMTS) SMS point-to-point and cell broadcast services can be provided over DECT. To enable DECT terminals to interwork with DECT systems which are connected to the UMTS infrastructure, from the DECT side of the present document is based on EN 300 444 [15] and on the DECT Common Interface specification EN 300 175 parts 1 [1] to 8 [8] (for the cases not covered by Generic Access Profile (GAP)), from UMTS side the present document assumes interworking with UMTS specification release 1999.

An air_interface profile is specified for a particular set of UMTS services so that inter_operability of DECT equipment for these services can be achieved. Interworking functions/mappings are specified for attachment for the DECT FP as the FP is using the Iu_interface towards the UMTS core network in the respect that the FP emulates a UTRAN Radio Network Controller (RNC).

A PP conforming to the present document should be capable of distinguishing a FP conforming to the present document from a FP conforming to the GAP and to access and react upon it accordingly.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".

[3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".

[4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".

[5] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".

[6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".

[7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".

[8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".

[9] ETSI TS 101 863-1: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 1: General description and overview".

[10] Void.: "Empty".

[11] ETSI TS 101 863-3: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 3: 3,1 KHz speech service".

[12] Void.

[13] Void.

[14] Void.

[15] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".

[16] ETSI EN 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio".

[17] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".

[18] ETSI ETR 043: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Services and facilities requirements specification".

[19] ETSI EN 300 176 (all parts): "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification".

[20] ETSI TR 121 905: "Universal Mobile Telecommunications System (UMTS); Vocabulary for 3GPP Specifications".

[21] ETSI TS 122 003: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Circuit Teleservices supported by a Public Land Mobile Network (PLMN)".

[22] ETSI TS 123 002: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Network architecture".

[23] ETSI TS 123 038: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Alphabets and language-specific information".

[24] ETSI TS 123 040: "Digital cellular telecommunications system (GSM); Universal Mobile Telecommunications System (UMTS); Technical realization of the Short Message Service (SMS)".

[25] ETSI TS 123 041: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Technical realization of Cell Broadcast Service".

[26] ETSI TS 123 121: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Architectural Requirements for Release 1999".

[27] ETSI TS 124 002: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); GSM - UMTS Public Land Mobile Network (PLMN) access reference configuration".

[28] ETSI TS 124 007: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Mobile radio interface signalling layer 3; General aspects".

[29] ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[30] ETSI TS 124 011: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[31] ETSI TS 125 410: "Universal Mobile Telecommunications System (UMTS); UTRAN Iu Interface: General Aspects and Principles".

[32] ETSI TS 125 419: "Universal Mobile Telecommunications System (UMTS); UTRAN Iu Interface: Service Area Broadcast Protocol SABP".

[33] ETSI TS 127 005: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Cell Broadcast Service (CBS)".

[34] ETSI TS 131 102: "Universal Mobile Telecommunications System (UMTS); Characteristics of the USIM Application".

[35] ETSI EN 300 757: "Digital Enhanced Cordless Telecommunications (DECT); Low Rate Messaging Service (LRMS) including Short Messaging Service (SMS)".

[36] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 175-1 [1] and TR 121 905 [20] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in EN 300 175-1 [1] and TR 121 905 [20] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations defined in EN 300 175-1 [1], TR 121 905 [20] and the following apply:

ARI	Access Rights Identity
CBE	Cell Broadcast Entity
CC	Call Control
CM	Connection Management
C-Plane	Control-Plane
DECT	Digital Enhanced Cordless Telecommunications
FT	Fixed Termination
GAP	Generic Access Profile
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
IWU	InterWorking Unit
MM	Mobility Management
MT	Mobile Termination
NWK	NetWorK
PLMN	Public Land Mobile Network
PP	Portable Part
PT	Portable radio Termination
RNC	Radio Network Controller
SABP	Service Area Broadcast Protocol
SIM	Subscriber Identification Module
SMS	Short Message Service
SM-SC	Short Message service Service Centre
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USIM	UMTS Subscriber Identity Module
UTRAN	UMTS Terrestial Radio Access Network

4 General

The present document specifies how the UMTS point-to-point Short Message Services (SMSs) (UMTS teleservices 21 and 22) and cell broadcast service (UMTS teleservice 23) are provided over the DECT air interface.

One of the main objectives is to describe how the SMSs are mapped over the DECT air interface in a formal way, so that inter-operability of different manufacturer's equipment can be achieved. This is done by describing the interworking unit procedures and mappings loosely following ITU-T Recommendations Q.601 to Q.699 and by describing an air interface profile following ISO/IEC 9646-6 [36]. The last document enables the subsequent generation of tests cases, if required.

The present document is made up of 3 main clauses:

Clause 5: Interworking requirements - includes reference configurations and the protocol architecture models. Also describes the main service requirements. The context of the interworking profile is also required.

Clauses 6: Interworking Unit (IWU) mappings for SMSs shows the C-Plane mappings for the FP UMTS Public Land Mobile Network (PLMN) attachment. Two IWUs are considered; the FP IWU and the PP IWU, although the FP IWU is expected to be the largest. The signalling mappings are described in terms of IWU procedures with informative data flow diagrams. Detailed descriptions follow using tables of what is mapped, what is ignored, and what is transferred transparently. These clauses also include other profile specific information.

Clause 7: Connection types - this clause identifies the main DECT connection types (C-Plane) at the air interface supporting optimized groups of services, from the IWU mappings for different configurations/models.

5 Interworking requirements

5.1 General

The present document defines the mandatory requirements for the FP in terms of interworking functions between the air interface and the external network as well as minimum requirements at the DECT air interface. It also defines the mandatory requirements for the PP in terms of interworking functions between the air interface and the PA as well as the minimum requirements for the PP at the DECT air interface.

If not stated otherwise the TS 101 863-3 [11] requirements are the basis for the present document.

The interworking mappings shall be based on the UMTS Release 1999 Standards.

The basis for interworking shall be the protocols defined:

- in TS 123 038 [23];
- in TS 123 040 [24];
- in TS 123 041 [25];
- in TS 124 011 [30];
- in TS 125 419 [32].

The minimum requirement defined in LRMS EN 300 757 [35] shall be fulfilled in the PT and FT.

NOTE: This means that the support of Low Rate Messaging Service Point-To-Point (LRMS PTP) service is required.

The procedures which are used depend on which Access Rights Identifier (ARI) type is chosen by the PP; either according to the minimum requirements of LRMS EN 300 757 [35] or the procedures as described in the present document, i.e. the PPs, which are based on the present document shall always be capable of interworking with FP which fulfil the minimum requirements of LRMS PTP service. The FPs, which fulfil the requirements of the present document, and which support also non-GSM ARIs (classes A, B or C) shall also support the minimum requirements of the Data service profile E, class 2.

The present document defines interworking environments for the FP and the PP in the case when DECT FPs are functionally attached to the UMTS CN, i.e. broadcast attribute a39 "SIM services available" set to '1'B in all environments (public, business and residential). The PP shall be in alignment with the requirements as defined in the present document.

5.2 Reference configurations

Reference configurations describe the functional groupings of DECT and UMTS and their relationships via reference points. In general, reference points may or may not correspond to a physical interface. The functional groupings and reference points for UMTS access are described in TS 124 002 [27]. The UMTS network entities and physical interfaces are described in TS 123 002 [22]. The functional (logical) groupings and reference points for DECT are described in the present document.

5.2.1 FP functional attachment to the UMTS PLMN

Reference point "Iu" in figure 1 is the interface which supports the functional structure of the UMTS Iu-interface at the network layer.

Transfer of the short message between MSC/SGSN and UE is described in TS 124 011 [30].

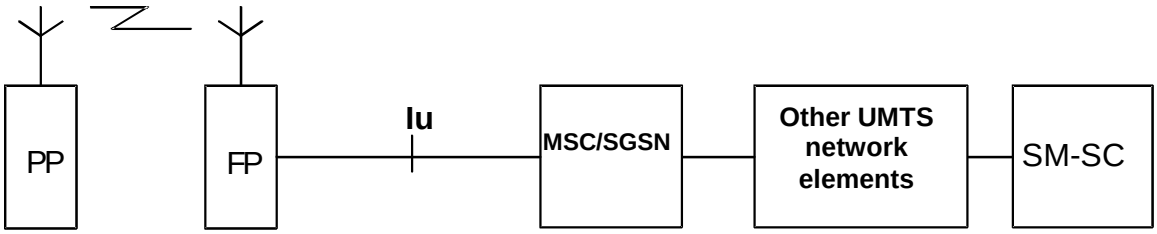


Figure 1: Attachment to the UMTS PLMN in the case of point-to-point SMS

Reference point "IuBC" in figure 2 is the interface which supports the functional structure of the respective interface defined in clause 9.1.2 of TS 123 041 [25] as a message transfer link 2 to support the cell broadcast protocols at this reference point. The present document defines only the DECT air interface functions for the provision of the Cell Broadcast Service (CBS) information over the DECT air interface.

SGSN is used in place of the MSC in case of SMS transfer over GPRS.

The protocol between the Cell Broadcast Centre (CBC) and RNC (or FP IWU) is defined in TS 125 419 [32] (Service Area Broadcast Protocol, SABP). It is defined over the IuBC reference point. The FP IWU shall fulfil the requirements for the RNC defined in TS 125 419 [32].

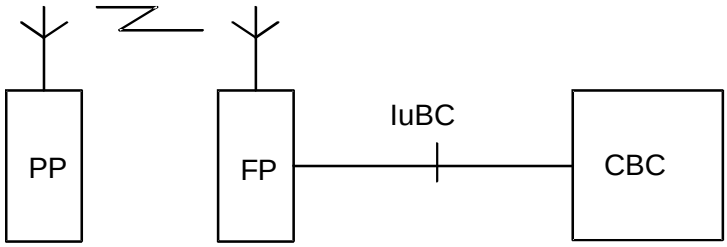


Figure 2: Attachment to the UMTS PLMN in the case of Cell broadcast Service

In the present document, UMTS or DECT procedures are considered only where mapping is required, i.e.:

- UMTS CM sublayer is covered in the present document as far as short message point-to-point services are concerned;
- the sublayers required by Cell Broadcast (CB) are concerned;
- mapping aspects for ciphering, paging and handover are covered in TS 101 863-3 [11].

5.3 Service requirements

General description of service requirements, functional capabilities and information flows are specified in TS 101 863-1 [9]. The detailed information regarding the supported service and service types is as follows. Table 1 defines the UMTS SMS as described in TS 122 003 [21] supported by the present document.

Table 1: The UMTS Teleservices supported by the present document

UMTS Teleservice number	Teleservice name
21	SMS, point-to-point, Mobile Originated (SM MO)
22	SMS, point-to-point, Mobile Terminated (SM MT)
23	SMS Cell Broadcast (CB)

5.4 General interworking model for FP UMTS PLMN attachment

The general interworking model shown in figures 3 and 4 for point-to-point and cell broadcast, respectively, describe the general profile reference configuration of the FP and PP containing the control (C) plane. The model also shows the location of the IWUs and the requirements of the air interface.

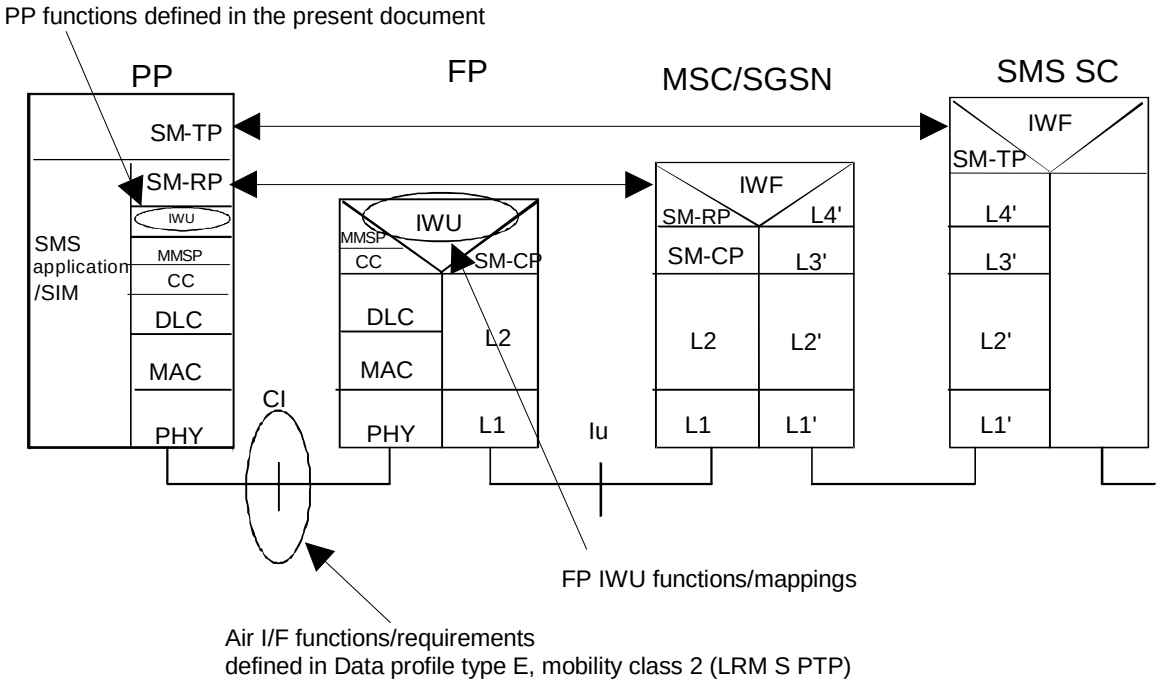


Figure 3: Interworking model of SMS, point-to-point, mobile originated and terminated (SM MO, SM MT) for FP UMTS PLMN attachment

The C-Plane part of the IWU (see figure 3) in the FP provides the mapping of the UMTS CM (a subset of the UMTS Layer 3) SMS related messages to the respective DECT layer 3 protocols (NWK/CC) and vice versa. The MM is composed of similar interworking model. The IWU in the PP provides the SMS message information transfer to the SMS application protocol layers.

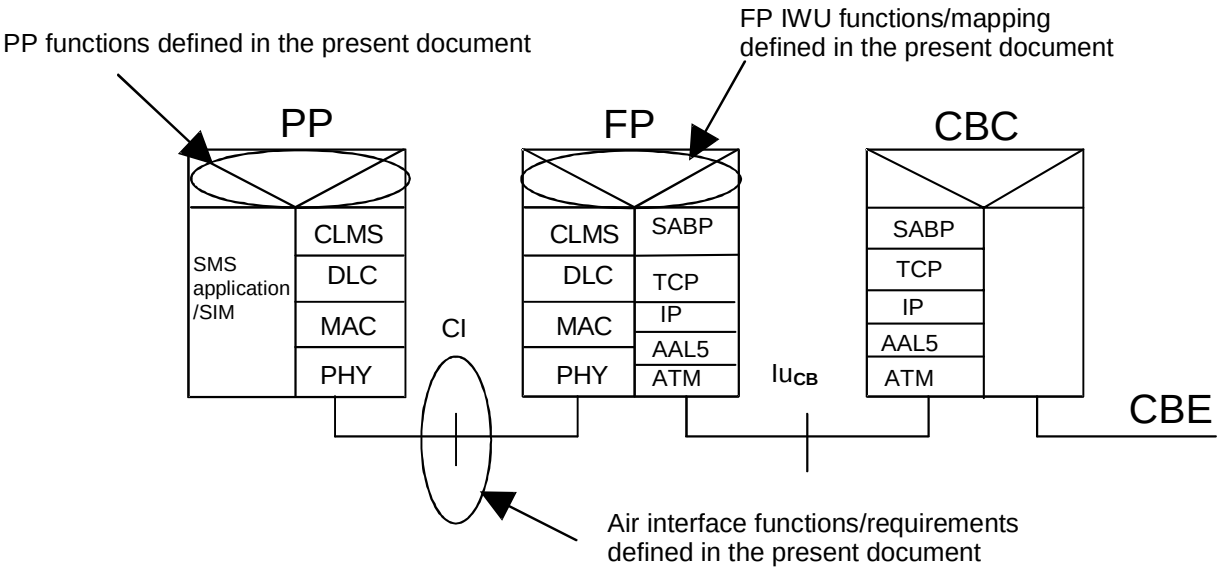


Figure 4: Interworking model Cell broadcast (CB) for FP UMTS PLMN attachment

The Iu interface of the broadcast domain (IuBC) of UMTS uses the Service Area Broadcast Protocol on the Radio Network Layer, TCP/IP on top of AAL5/ATM on the Transport Network Layer (see TS 125 410 [31]).

The C-Plane part of the IWU (see figure 4) in the FP provides the mapping of the TS 123 041 [25] Cell Broadcast message information to the respective DECT layer 3 protocols (Network/Connectionless Message Service (NWK/CLMS)). The IWU in the PP provides the SMS message information to the SMS application.

5.5 Interworking context

5.5.1 General

If either SM MO (UMTS teleservice 21) or SM MT (UMTS teleservice 22) are supported the CC entity of a PT and FT shall fulfil the requirements of LRMS EN 300 757 [35] LRMS PTP based on full GAP CC entity and the requirements of the present document. The MAC layer shall use the C_s channel for the service provision.

NOTE 1: The requirements of the CC and MM for the present document are listed in LRMS EN 300 757 [35] with conditions to "LRMS PTP supported" and "GAP call control supported" and in TS 101 863-3 [11] for those requirements set in the present document.

NOTE 2: The additional requirements over the basic GAP CC entity is the support of the MMSP (Multimedia Messaging Service Protocol).

The data service profile E, class 2 (see LRMS EN 300 757 [35]) MMSP protocol layer in conjunction with the DECT CC entity shall be used as a transport mechanism for the UMTS SMS SM-RP layer messages. If external handover is supported then the MMSP acknowledgements shall be used for mapping of the SMS Control Layer Protocol (SM-CP) acknowledgements. Thus the PP has UMTS SM-TP and SM-RP protocol layers.

If both SM MO and SM MT are supported, they shall be supported simultaneously by independent CC instances. The SM MO and SM MT shall be supported simultaneously and independently from possible other CC instances. This implies that all simultaneously ongoing CC instances (e.g. voice, SM MO, and SM MT) use different transaction identifiers.

If the SMS cell broadcast (UMTS teleservice 23) interworking is supported the requirements of the CLMS FIXED service as specified in EN 300 175-5 [5] shall apply. This means the usage of Connectionless Message Service (CLMS) entity on the DECT network layer.

The MM entity in the FT and PT shall fulfil the requirements of the TS 101 863-3 [11].

NOTE 3: As a result this the PP profile also fulfils the minimum MM requirements of GAP, EN 300 444 [15].

No U-plane is required by the present document.

In all cases, SM MT, SM MO and CB, the received or sent short messages shall be handled by the SMS application in the PP. It shall be the responsibility of the application to take care of the conversion between the DECT character set and UMTS character set (see TS 123 038 [23]), if conversion is needed.

NOTE 4: This is since the SMS 7 bit character set contains codes which have a specific meaning in the DECT display controlling.

The present document does not require the support of the GAP based voice services i.e. the PP may be a data only terminal with UMTS access capabilities and a UMTS subscription as defined in TS 101 863-3 [11].

5.5.2 Basic interworking rules

The basic interworking rules defined in clause 5.4.2 of TS 101 863-3 [11] shall apply with the following definitions:

- an FP belonging to ARI class D shall support the present document;
- the profile as defined in the present document may be used in association only with FPs with ARI class D;
- a PP belonging to ARI class D shall support the present document in addition to the minimum requirements of the E.2 profile point-to-point service (LRMS PTP) (see LRMS EN 300 757 [35]).

Table 2 defines the associated UMTS and DECT procedures required in the FP and the PP.

Table 2: Implementation/support requirements of DECT and UMTS procedures in the FP and the PP

UMTS procedure	DECT procedure	PP	FP
Authentication procedure	Authentication of PT	M	M
Identity procedure	Identification of PT	M	M
Attach procedure	Attach (= Location registration)	M	M
Detach procedure	Detach	M	M
Location updating procedure	Location registration	M	M
Temporary Mobile Subscriber Identity (TMSI) re-allocation procedure	Temporary identity assignment	M	M
Ciphering procedure	Cipher-switching initiated by FT Cipher-switching initiated by PT	M (see note 1)	M (see note 1)
MSC/SGSN associated relocation	External handover	O (see note 2)	O (see note 2)
CM service procedure	Outgoing call request	M	M
MM status procedure	-	-	I
-	Parameter retrieval (Location update)	M	M
Connection establishment for SMS MO/PP	Outgoing call request	M	M
Connection establishment for SMS MT/PP	Incoming call request	M	M
Accepted connection establishment	Accepted call establishment	M	M
Abnormal procedures	Abnormal call release (call reject)	M	M
Normal connection release	Normal call release	M	M
RP Data Unit transfer	External protocol information transfer (see note 3)	M	M
Paging	Paging	M	M
CB message transfer	CLMS message transmission procedures for fixed length messages	M	M

NOTE 1: Cipher switching initiated by the PT may depend on the implementation of external handover procedure.
NOTE 2: The implementation of this feature is optional in the PT and FT. Interworking requirements/mappings are process mandatory.
NOTE 3: This procedure consists of transferring external protocol information during the active state of DECT Call Control by using the IWU-INFO message.
TMSI: Temporary Mobile Subscriber Identity.

5.5.3 Interpretation of broadcast attributes

This clause refers to annex F of EN 300 175-5 [5] (Broadcast attributes coding). The codings of TS 101 863-3 [11] shall apply with the exceptions and additions listed below.

Standard capabilities:

- **a32 Adaptive Differential Pulse Code Modulation (ADPCM)/G.721 Voice service:** may be set to value '1' (see note);
- **a33 PAP/GAP voice supported:** may be set to value '1' (see note);
- **a42 CLMS service available:** if the Cell Broadcast service is supported, shall be set to value '1'.

Extended fixed part capabilities:

- **a43 E data profile:** shall be set to value '1'.

NOTE: The present document does not require the support of the voice service.

5.5.4 Interpretation of terminal capability

The <<TERMINAL CAPABILITY>> information element shall be used with the coding " DECT/UMTS-GSM interworking - UMTS-GSM SMS service supported".

6 Interworking mappings, FP attached to the UMTS PLMN

6.1 FP C-plane IWU procedures

The procedure descriptions have been given with Call Control primitives since the MMSP protocol features are not directly used. That is, the MMSP is used in conjunction with CC for SMS message transmissions. If external handover is supported then some specific features of the MMSP shall be used to guarantee safe transmissions. If the MMSP primitives defined in LRMS EN 300 757 [35] are used the mappings between the call control primitives and MMSP primitives can be found in the E data profile.

In UMTS SM can be transferred using a C-plane connection of the GMMin the packet switched (PS) domain or the MM in the circuit switched (CS) domain. The protocol architecture for 3G SMS can be found in TS 123 121 [26], figure 4.45.

6.1.1 Call handling SM MO IWU procedures

A general example of SM MO call setup, message transfer and connection release is illustrated in annex C.

6.1.1.1 Call setup procedure (UMTS CS-domain)

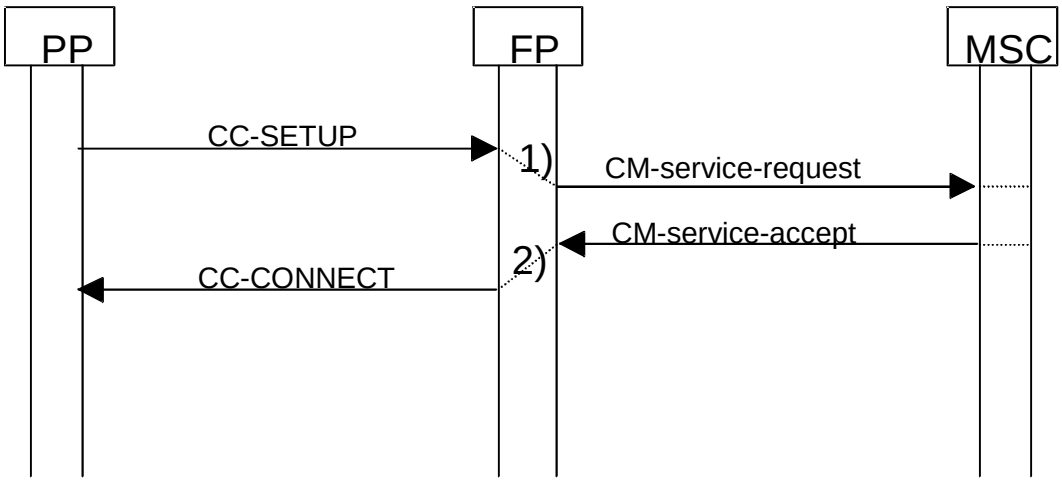


Figure 5: SM MO CM service procedure, no authentication nor ciphering procedure

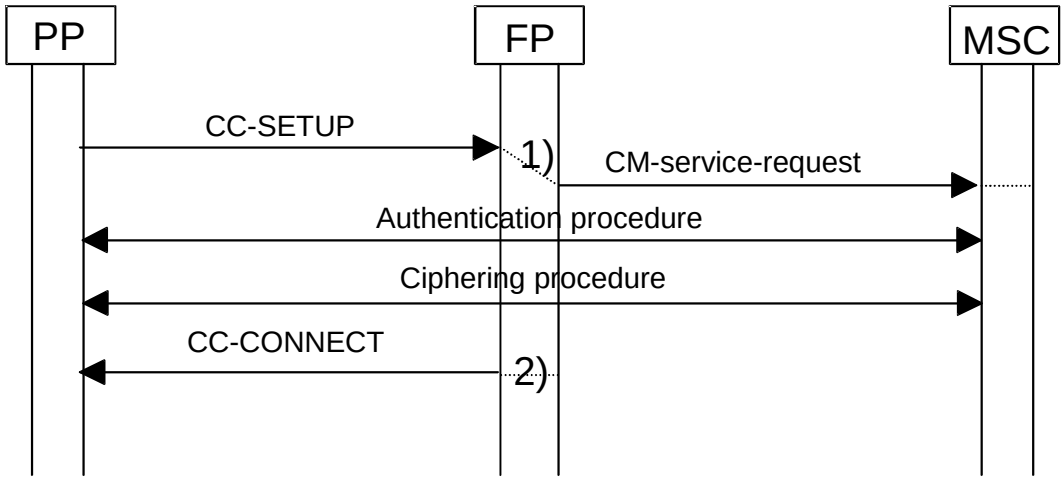


Figure 5a: SM MO CM service procedure, with common (identification/authentication and ciphering) procedures

1) Upon receipt of one or more {IWU-INFO} (see figure 7) message coded as {MMS-SEND} message from the PP the FP CC reassembles the possibly segmented frame and issues MNCC-IWU-INFO-ind primitive to the FP IWU. The FP IWU shall map the complete message carried in <<IWU-TO-IWU>> information element to the <<CP-User data>> information element of the UMTS {CP-DATA} message to be submitted towards the MSC. The mapping between the messages is defined in clause 6.1.9.2.2.

The <<call attributes>>, <<Connection attributes>> and <<iwu attributes>> element usage in {CC-SETUP} message is not required. The default values have been listed in clause 7.

The <<basic service>> element in {CC-SETUP} message shall contain the coding as defined in clause 7.

If the FP does not support the SMS procedures the FP IWU shall reject the call by issuing MNCC-REJECT-req primitive with cause code "Service not supported".

2) Upon receipt of {CM-service-accept} (see figure 5) or after a successful completion of the ciphering procedure (see figure 5a) the FP IWU shall send to the PP {CC-CONNECT} message by issuing MNCC-CONNECT-req primitive. The mapping of {CM-service-accept} to the {CC-CONNECT} message is illustrated in clause 6.1.9.1.1. The {CC-CONNECT} message (see figure 5a) triggered by MNCC-CONNECT-req primitive if authentication and ciphering procedure has taken place shall contain the values and elements as defined in GAP, EN 300 444 [15].

NOTE 1: The authentication and ciphering procedures are done as specified in TS 101 863-3 [11].

The FP shall always reply with {CC-CONNECT} message to the received {CC-SETUP}.

NOTE 2: This implies that FP CC moves from "call initiated" directly to the "active" state and does not send any messages related to "call proceeding" or "overlap sending" states.

6.1.1.2 Call setup procedure (UMTS GPRS, PS-domain)

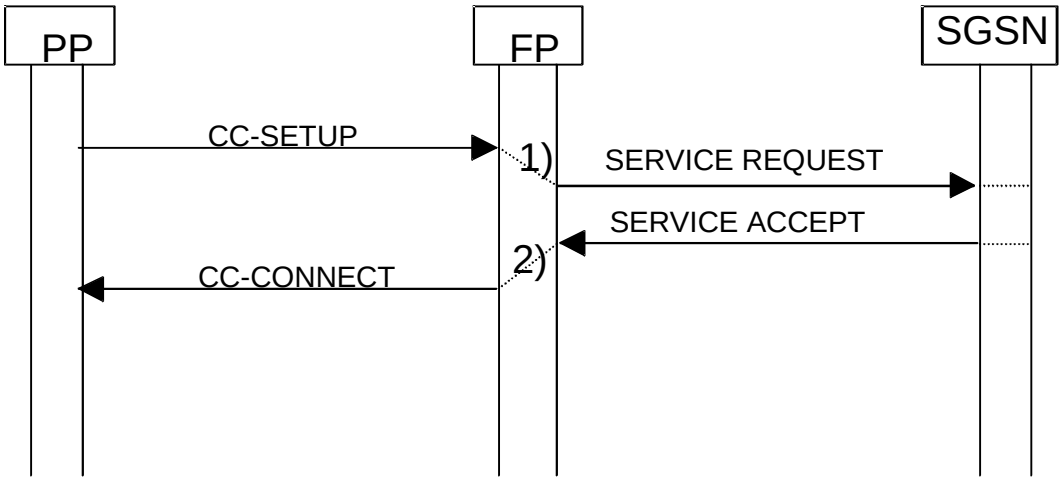


Figure 6: SM MO CM service procedure, no authentication nor ciphering procedure

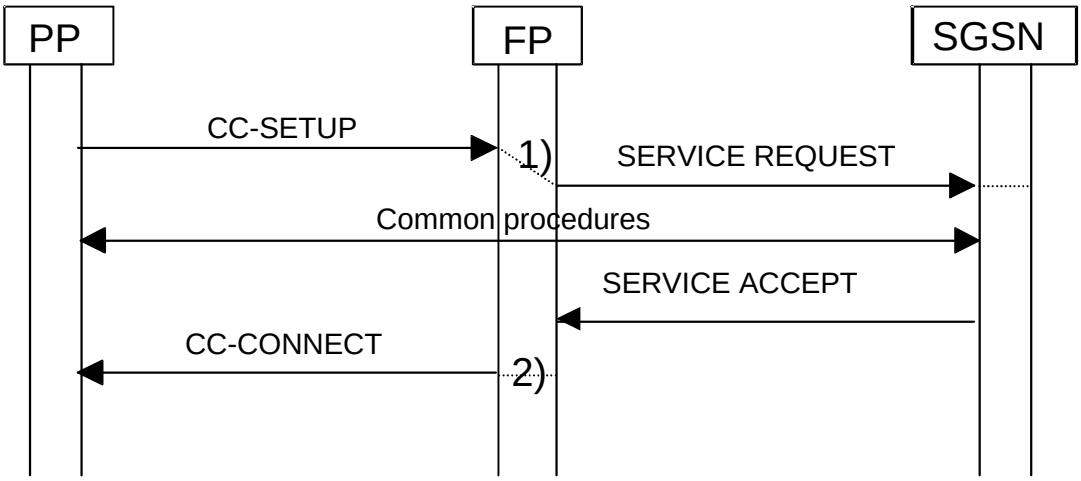


Figure 6a: SM MO CM service procedure, with common (identification/authentication and ciphering) procedures

1) Upon receipt of {CC-SETUP} from the PP (see figures 5a and 6a) reflected by MNCC-SETUP-ind primitive the FP IWU shall initiate a UMTS service request procedure (see TS 124 008 [29], clause 4.7.13) by sending a {SERVICE REQUEST} to the SGSN. The mapping of the DECT {CC-SETUP} message information elements to the UMTS { SERVICE REQUEST} message is illustrated in clause 6.1.9.2.1a.

The <<call attributes>>, <<Connection attributes>> and <<iwu attributes>> element usage in {CC-SETUP} message is not required. The default values have been listed in clause 7.

The <<basic service>> element in {CC-SETUP} message shall contain the coding as defined in clause 7.

If the FP does not support the SMS procedures the FP IWU shall reject the call by issuing MNCC-REJECT-req primitive with cause code "Service not supported".

2) Upon receipt of {SERVICE ACCEPT} (see figure 6) and after a successful completion of the common procedures (see figure 6a) the FP IWU shall send to the PP {CC-CONNECT} message by issuing MNCC-CONNECT-req primitive. The mapping of {SERVICE ACCEPT} to the {CC-CONNECT} message is illustrated in clause 6.1.9.1.1a. The {CC-CONNECT} message (see figure 6a) triggered by MNCC-CONNECT-req primitive if authentication and ciphering procedure has taken place shall contain the values and elements as defined in GAP, EN 300 444 [15].

NOTE 1: The authentication and ciphering procedures are done as specified in TS 101 863-3 [11].

The FP shall always reply with {CC-CONNECT} message to the received {CC-SETUP}.

NOTE 2: This implies that FP CC moves from "call initiated" directly to the "active" state and does not send any messages related to "call proceeding" or "overlap sending" states.

6.1.1.2a CM service procedure abnormal cases

CM service procedure abnormal cases shall be handled as described in TS 101 863-3 [11], in clause 5.1.8. The mappings between the messages shall be done as specified in TS 101 863-3 [11] with the exception of <Protocol discriminator> field which is mapped as specified in clauses 6.1.11.1.1 and 6.1.11.2.1 of the present document.

6.1.1.2b Service procedure abnormal cases

Service procedure abnormal cases shall be handled as described in TS 124 008 [29], clause 4.5.1.6.2, the interworking shall follow the principles of TS 101 863-3 [11], clause 5.1.8 with the exception of <Protocol discriminator> field which is mapped as specified in clauses 6.1.11.1.1 and 6.1.11.2.1 of the present document.

6.1.1.3 Short message transfer procedure

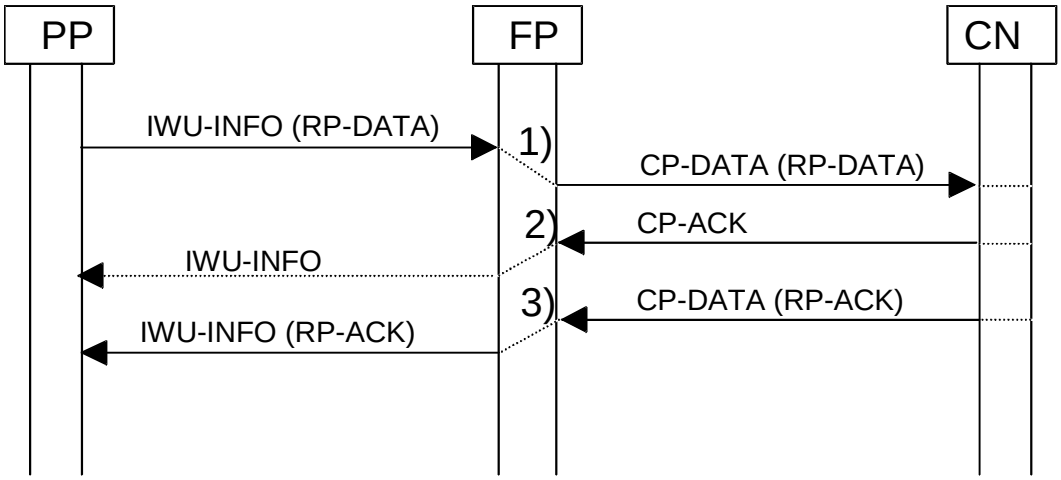


Figure 7: SM MO data transfer procedure

1) Upon receipt of one or more {IWU-INFO} (see figure 7) message coded as {MMS-SEND} message from the PP the FP CC reassembles the possibly segmented frame and issues MNCC-IWU-INFO-ind primitive to the FP IWU. The FP IWU shall map the complete message carried in <<IWU-TO-IWU>> information element to the <<CP-User data>> information element of the UMTS {CP-DATA} message. to be submitted towards the MSC. The mapping between the messages is defined in clause 6.1.9.2.2.

2) Should the <Reply requested> field of the <<MMS-Generic Header>> information element have value '11' or '10' in the previously received {IWU-INFO} message, upon receipt of the {CP-ACK} (see figure 7) message from the MSC the FP IWU shall send {IWU-INFO} message coded as {MMS-SEND-RPY} message to the PP by issuing MNCC-IWU-INFO-req primitive. The mapping between the messages is defined in clause 6.1.9.1.3.

3) Upon receipt of the {CP-DATA} (see figure 7) message from the MSC the FP IWU shall submit the <<CP-User data>> information element contents (SM-RP layer Protocol Data Unit (RPDU)) to the FP CC entity using MNCC-IWU-INFO-req primitive. The <<CP-User data>> information element shall be mapped into the {IWU-INFO} message <<IWU-TO-IWU>> information element. The <<segmented info>> information element has to be used as specified LRMS EN 300 757 [35] if the {IWU-INFO} message length exceeds the E profile segmentation length. The {IWU-INFO} message that is sent to the PP by the FP IWU shall be coded as {MMS-SEND} message. The mapping of the {CP-DATA} message information elements to the {IWU-INFO} is shown in clause 6.1.9.1.2.

6.1.1.4 Connection release procedure

The CC connection is released by the PP, unless an abnormal situation occurs or the CN requests it. The normal connection release shall be done using {CC-RELEASE} and {CC-RELEASE-COM} messages by issuing MNCC-RELEASE-req primitive. The PP IWU shall request CC connection release upon receipt of MNSMS-REL-req from the application layers. Partial release shall be used as specified in TS 101 863-3 [11].

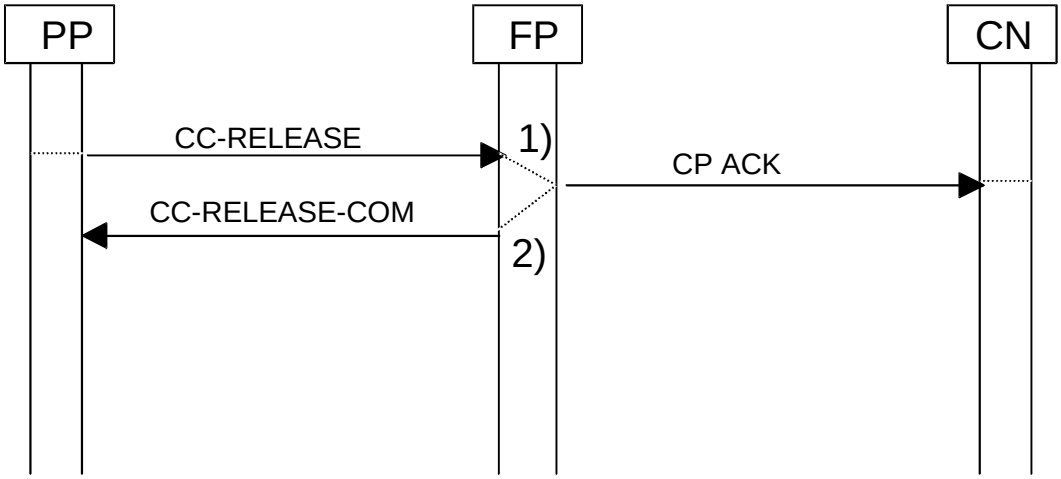


Figure 8: SM MO normal connection release procedure

1) Upon receipt of the {CC-RELEASE} message (see figure 8) from the PP reflected by CC-RELEASE-Ind and indicating a partial release the FP IWU shall issue {CP-ACK} towards the MSC if the previously received {CP-DATA} message has not yet been acknowledged. The mapping between the messages has been given in clause 6.1.9.2.4.

2) The FP IWU shall then confirm the connection release by issuing the MNCC-RELEASE-res primitive.

6.1.1.5 Error procedures

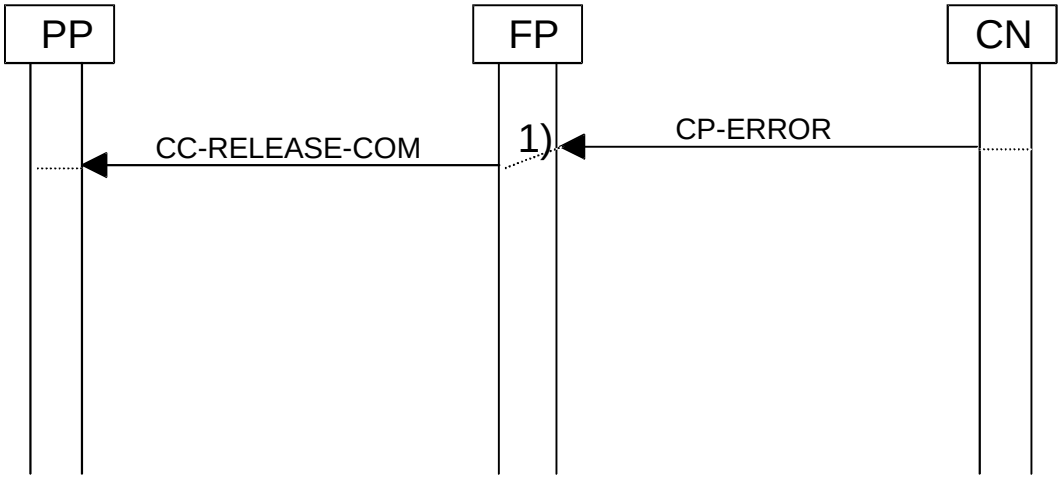


Figure 9: SMS-MO CP error procedure

1) Upon receipt of {CP-ERROR} (see figure 9) message from the MSC the FP IWU shall issue MNCC-REJECT-req primitive whereupon the FP CC sends the {CC-RELEASE-COM} message indicating abnormal release. The <<cause code>> information element in the {CP-ERROR} message may be mapped into the
{CC-RELEASE-COM} message <<Release reason>> information element. The message mapping between {CP-ERROR} and {CC-RELEASE-COM} message is illustrated in clause 6.1.9.1.5.

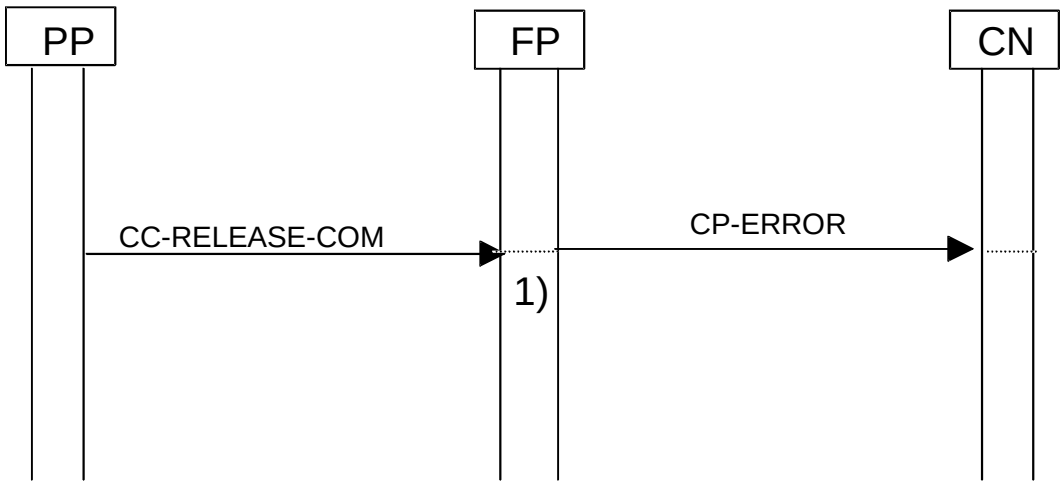


Figure 10: SM MO connection released due to unsuccessful CC data transfer

An abnormal connection release due to unsuccessful CC transfer towards the PP is illustrated in figure 10.

1) Upon receipt MNCC-REJECT-cfm primitive as a result of {CC-RELEASE-COM} message indicating abnormal release (figure 10) the FP IWU shall send {CP-ERROR} message to the MSC if the previous {CP-DATA} message has not been acknowledged. The information element mapping of {CC-RELEASE-COM} message into the {CP-ERROR} is illustrated in clause 6.1.9.2.5. The mapping between {CC-RELEASE-COM} <<Release reason>> information element and {CP-ERROR} <<cause code>> is optional. If mapping is not done the {CP-ERROR} shall have CP-Cause #111 "Protocol error".

6.1.2 Other IWU procedures

Other IWU procedures shall be done according to TS 101 863-3 [11].

6.1.3 Call handling SM MT IWU procedures

A general example of SM MT call setup, message transfer and connection release has been illustrated in annex C of the present document.

6.1.3.1 Call setup procedure (UMTS CS-domain)

After the paging procedure (see figure 11) which complies with TS 101 863-3 [11], clause 6.1.3 the authentication and ciphering procedures complying with TS 101 863-3 [11], clauses 6.1.2.1 and 6.1.2.6, respectively, may take place (see figure 11a).

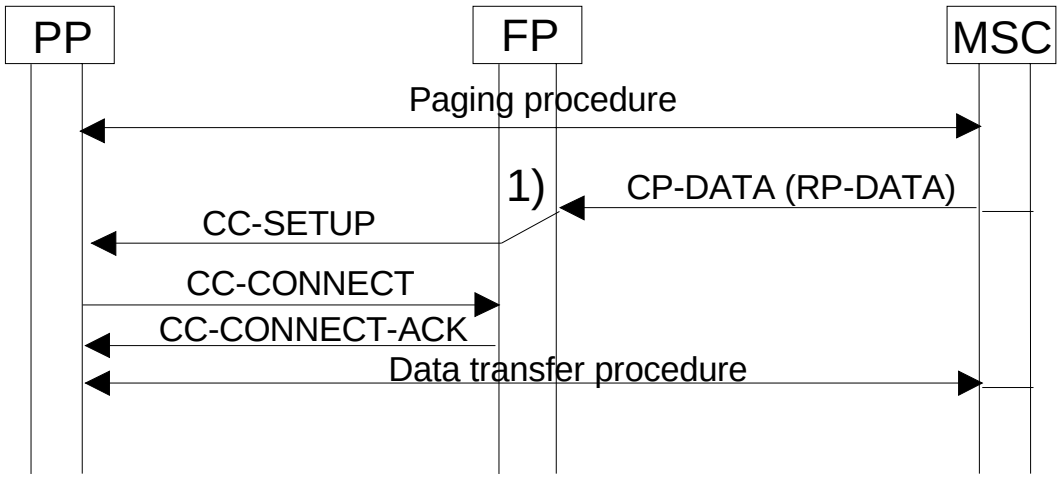


Figure 11: SM MT setup procedure, no authentication nor ciphering procedure

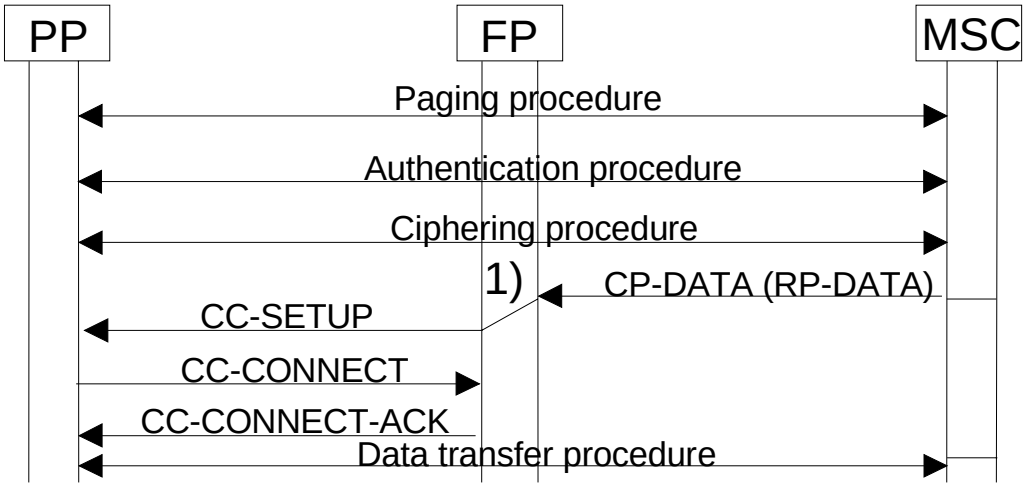


Figure 11a: SM MT connection setup procedure

The reception of {CP-DATA} to the FP IWU shall initiate the CC connection setup procedure. When the connection has been established the short message shall be sent over in {IWU-INFO} messages.

1) Upon receipt of the {CP-DATA} message from the MSC (see figures 11 and 12) the FP IWU shall initiate the connection setup procedure if no connection is available by issuing MNCC-SETUP-req primitive to the FP CC which sends the {CC-SETUP} message to the PP. The mapping between {CP-DATA} and {CC-SETUP} messages has been given in clause 6.1.9.1.4.

If the connection establishment is successful the PP shall reply with {CC-CONNECT} message to the FP CC indicated by MNCC-CONNECT-ind primitive to the FP IWU. Upon this the FP shall send {CC-CONNECT-ACK} message triggered by MNCC-CONNECT-ACK-req primitive.

NOTE 1: The {CC-CONNECT-ACK} is sent due to GAP compatibility requirements. The messages have no meaning for the SMS service.

NOTE 2: For the messaging call setups (as indicated in the <call class> field) the receive path for this specific CC instance should be muted when the U-plane is connected according to EN 300 175-5 [5], clause 9.3.2.8.

The <<call attributes>>, <<Connection attributes>> and <<iwu attributes>> element usage is not required. The default values have been listed in clause 7.

The <<basic service>> element in the {CC-SETUP} message shall contain the coding as defined in clause 7.

After the call setup procedure the information carried in the {CP-DATA} message shall be conveyed as described in clause 6.1.3.3.

6.1.3.2 Call setup procedure (UMTS GPRS, PS-domain)

After the paging procedure (see figure 11a) the authentication and ciphering procedures may take place (see figure 12a).

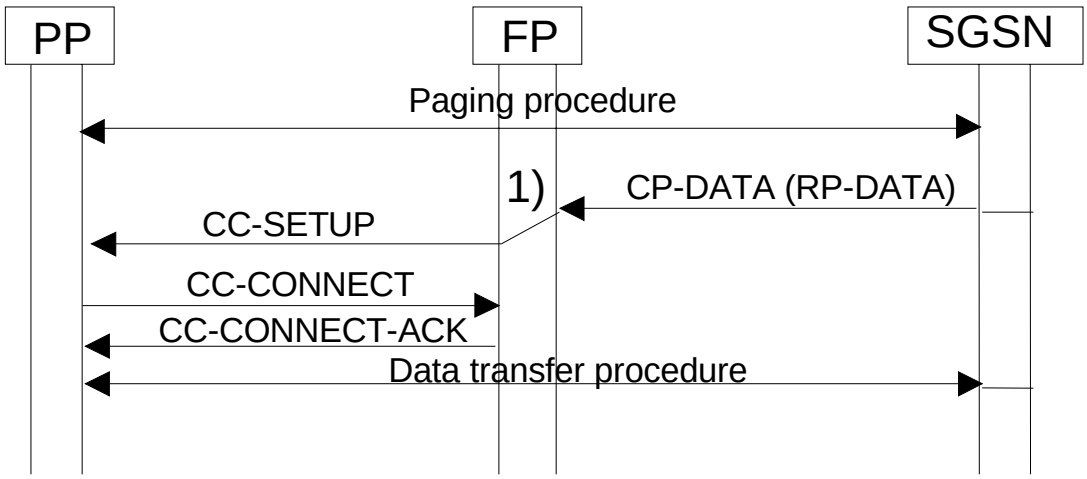


Figure 12: SM MT setup procedure, no authentication nor ciphering procedure

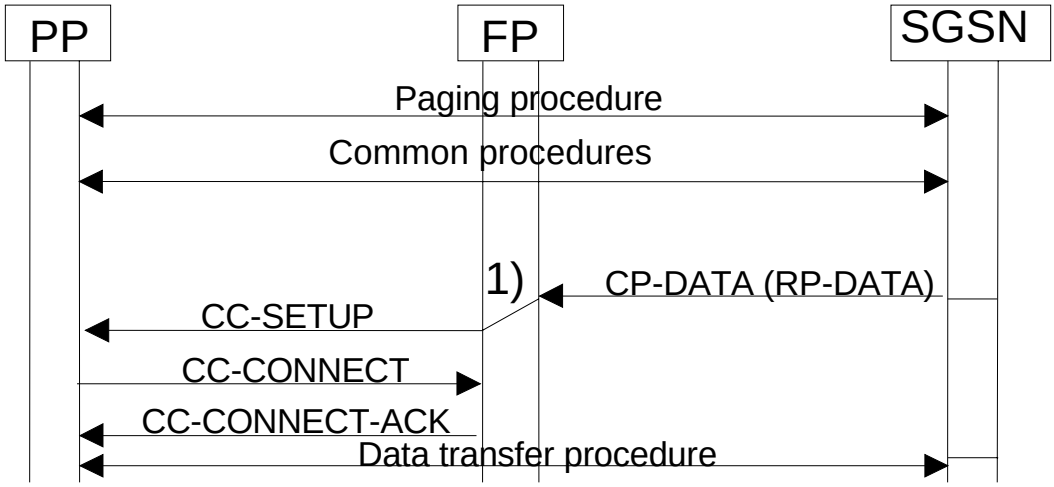


Figure 12a: SM MT connection setup procedure

The reception of {CP-DATA} to the FP IWU shall initiate the CC connection setup procedure. When the connection has been established the short message shall be sent over in {IWU-INFO} messages.

1) Upon receipt of the {CP-DATA} message from the SGSN (see figures 11a and 12a) the FP IWU shall initiate the connection setup procedure if no connection is available by issuing MNCC-SETUP-req primitive to the FP CC which sends the {CC-SETUP} message to the PP. The mapping between {CP-DATA} and {CC-SETUP} messages has been given in clause 6.1.9.1.4.

If the connection establishment is successful the PP shall reply with {CC-CONNECT} message to the FP CC indicated by MNCC-CONNECT-ind primitive to the FP IWU. Upon this the FP shall send {CC-CONNECT-ACK} message triggered by MNCC-CONNECT-ACK-req primitive.

NOTE 1: The {CC-CONNECT-ACK} is sent due to GAP compatibility requirements. The messages have no meaning for the SMS service.

NOTE 2: For the messaging call setups (as indicated in the <call class> field) the receive path for this specific CC instance should be muted when the U-plane is connected according to EN 300 175-5 [5], clause 9.3.2.8.

The <<call attributes>>, <<Connection attributes>> and <<iwu attributes>> element usage is not required. The default values have been listed in clause 7.

The <<basic service>> element in the {CC-SETUP} message shall contain the coding as defined in clause 7.

After the call setup procedure the information carried in the {CP-DATA} message shall be conveyed as described in clause 6.1.3.3.

6.1.3.2a Call setup abnormal situations

The received {CC-RELEASE-COM} message, indicated by MNCC-REJECT-ind, in the case of PP reject, shall be mapped into {CP-ERROR} message by FP IWU as defined in clause 6.1.1.5.

In the case of FP connection setup failure indicated by MNCC-RELEASE-ind reflected by {CC-RELEASE} message or MNCC-REJECT-ind primitive reflected by {CC-RELEASE-COM} message or due to FP CC timer expiry the FP IWU shall issue {CP-ERROR} message towards the MSC. The message mappings between the by {CC-RELEASE} message and {CP-ERROR} has been given in clause 6.1.9.2.3 and between the {CC-RELEASE-COM} message and {CP-ERROR} in clause 6.1.9.2.5.

6.1.3.3 Short message transfer procedure

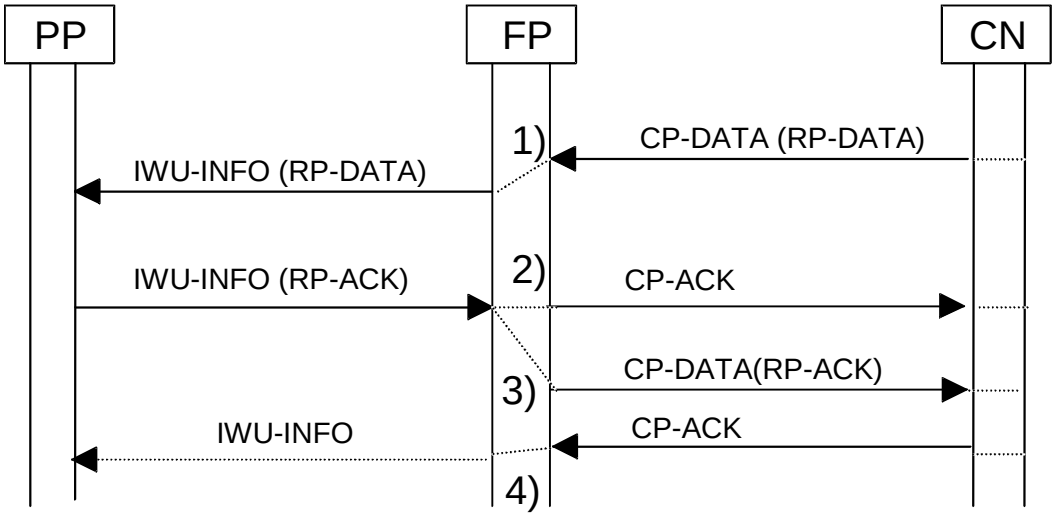


Figure 13: SMS data transfer procedure in SM MT case

1) After the connection establishment has been confirmed by the receipt of the {CC-CONNECT} message, reflected by the MNCC-CONNECT-ind primitive, the FP IWU shall send the <<CP-User data>> (RPDU) of the {CP-DATA} in {IWU-INFO} (see figure 13) message coded as {MMS-SEND} to the PP by issuing a MNCC-IWU-INFO-Req to the CC. The <<segmented info>> information element has to be used as specified in LRMS EN 300 757 [35] if the {IWU-INFO} message length exceeds the E profile segmentation length. The {CP-DATA} is the same as illustrated in figure 11a. The mapping between {CP-DATA} and {IWU-INFO} has been defined in clause 6.1.9.1.2.

2) Upon receipt of the next {IWU-INFO} message, indicated by MNCC-IWU-INFO-ind primitive, coded as {MMS-SEND} and carrying the {RP-ACK} message from the PP, the FP IWU shall send the {CP-ACK} reply to the MSC as a response to the previously received {CP-DATA}. No message mapping shall take place.

3) The FP IWU shall map the complete message carried in <<IWU-TO-IWU>> information element (RPDU) of the previously received {IWU-INFO} message to the <<CP-User data>> information element of the UMTS {CP-DATA} message. The mapping between the messages is defined in clause 6.1.9.2.2. The {CP-DATA} message shall then be submitted towards the MSC.

4) Should the <Reply requested> field of the <<MMS-Generic Header>> information element have value '11' or '10' in the previously received {IWU-INFO} message, upon receipt of the {CP-ACK} (see figure 13) message from the MSC the FP IWU shall send {IWU-INFO} message coded as {MMS-SEND-RPY} message to the PP by issuing MNCC-IWU-INFO-req primitive. The mapping between the messages is defined in clause 6.1.9.1.3.

6.1.3.4 Connection release procedure

The CC connection is released by the PP, unless an abnormal situation occurs or the MSC requests it by using BSSMAP message {CLEAR-CMD} as specified in TS 101 863-3 [11]. The normal connection release shall be done using {CC-RELEASE} and {CC-RELEASE-COM} messages by issuing MNCC-RELEASE-req primitive. The PP IWU shall request CC connection release upon receipt of MNSMS-REL-req from the application layers. Partial release shall be used as specified in TS 101 863-3 [11].

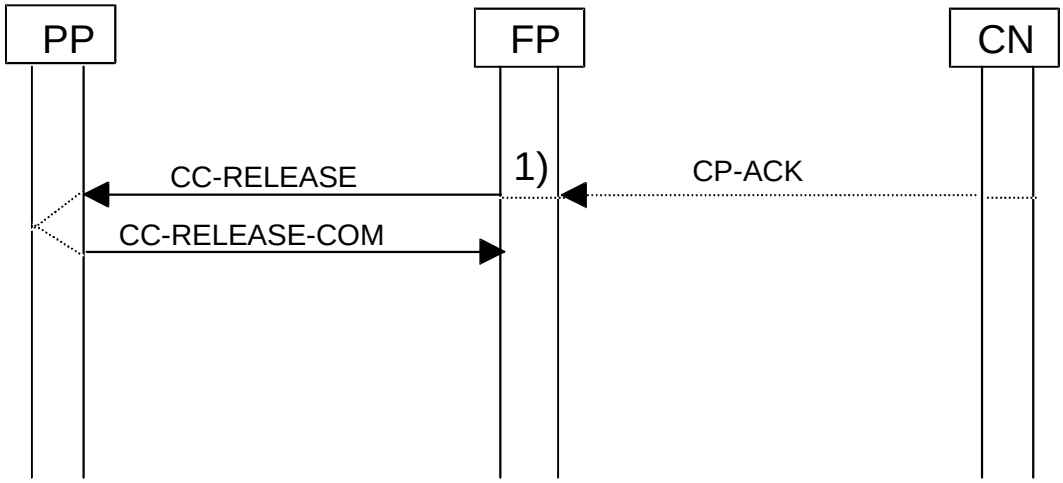


Figure 14: SM MT normal connection release procedure

1) Upon receipt of the {CP-ACK} message from the MSC (see figure 14) the FP IWU may initiate the normal connection release procedure with release reason "partial release" as defined in TS 101 863-3 [11] by issuing MNCC-RELEASE-Req primitive to the FP CC. The mapping between messages has been given in clause 6.1.9.1.6.

No action shall be taken by the FP IWU towards the MSC upon receipt of partial release from the PP.

6.1.3.5 Error procedures

The rules in clause 6.1.1.5 shall apply.

6.1.4 External handover procedures

The external handover support is as specified in TS 101 863-3 [11].

6.1.5 Other call handling procedures

Other CC mappings and procedures shall be done according to TS 101 863-3 [11].

6.1.6 CLMS/CB IWU procedures

The CLMS FIXED service as specified in clause 8.3 of EN 300 175-5 [5] shall be used for the UMTS SMS Cell Broadcast provision. Multisection CLMS FIXED messages shall be used.

Since UMTS CB message (page) length is 88 octets whereas the CLMS-FIXED can carry only 20 octets of user data a segmentation function for delivering 88 octets over CLMS-FIXED service shall be used. The six sections of a CLMS-FIXED consisting of one address section and five data section form a (multisection) group to be used as a basis for this segmentation.

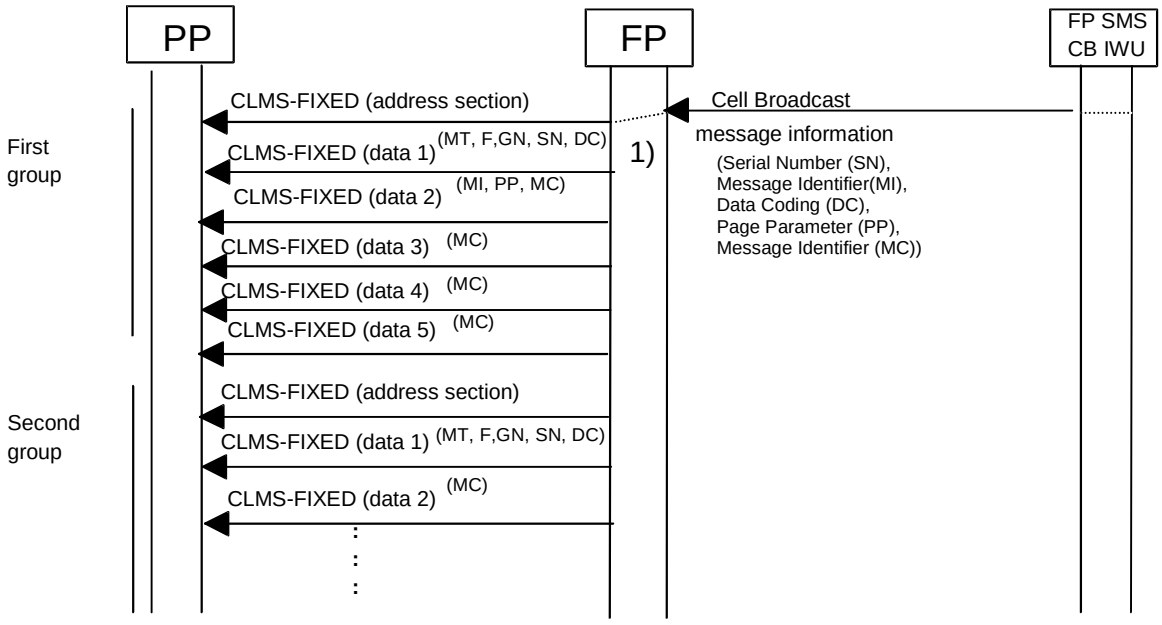


Figure 15: Cell Broadcast message transfer procedure

1) The FP IWU shall map the received SMS Cell Broadcast information (see figure 15) to the DECT {CLMS-FIXED} message as defined in clause 6.1.12 of the present document. The transmission of the {CLMS-FIXED} message(s) shall be initiated by MNCL-UNITDATA-req primitive.

The CLMS-FIXED message shall be coded as defined in clause 8.3 of EN 300 175-5 [5].

The <CLMS header> field of the address section shall have value '110'B indicating "Alphanumeric multisection". The <Address> field carrying the Temporary Portable User Identity (TPUI) that shall be the CBI as defined in EN 300 175-6 [6] clause 6.3.1. The <character type> field of the <<Protocol Discriminator>> shall have value '000'B indicating "User Specific". The <character set> field of the <<Protocol Discriminator>> shall have value '001'B. Other fields of the <<Protocol Discriminator>> field shall be ignored. The <Length indicator> shall have the length as defined in clause 8.3.2 of EN 300 175-5 [5].

The <CLMS header> field of the data section shall have the data section numbering as defined in clause 8.3 of EN 300 175-5 [5]. The octet 2 of the first data section shall be coded as specified below.

First data section octet 2 coding:

Bit	8	7	6	5	4	3	2	1
	Message type			F	Group number			

Message type:

Bits 8 7 6 Meaning (octet 2):

0 0 1 CB message

All other values reserved.

F bit coding:

Bits 5 Meaning (octet 2):

1 First group section follows

0 Subsequent group section follows

Group number:

Bits 4 3 2 1 Meaning (octet 2):

n n n n Group number

The group sections shall be numbered in descending order and it carries the amount of remaining group parts.

The <message type> shall have value '001'B indicating "UMTS CB message". The first group shall have value '1'B in the F bit coding field and the following group parts shall use value '0'B. The <Group number> shall contain the value of the remaining group parts.

NOTE 1: Thus if there is only one group to be sent the <F> field has value '1'B and <Group number> value '0000'B.

The octets 3 and 4 of the first data section shall contain the CB Serial Number (SN) and octet 5 the Data Coding scheme (DC) in the first data section. The Message Identifier (MI) shall be carried in the second data section in octets 2 and 3 and the Page Parameter (PP) in octet 4. The octet 5 shall carry the first octet of Message Contents (MC) The remaining data sections (3 to 5) shall be filled with CB Message Contents (MC).

If the UMTS CB message contents length exceeds 19 octets the message shall be sent in multiple CLMS FIXED message groups by first segmenting the CB message into 19 octet segment and then issuing MNCL-UNTIDATA-req primitives subsequently to the CLMS entity. In all groups the address section and first data section shall be repeated with the same coding as defined for above. The remaining data sections (3 to 5) shall be filled with CB Message Contents (MC). Should a CLMS-FIXED not be filled with Message Contents the remaining message part shall be filled with fill characters as defined in EN 300 175-5 [5], clause 8.3.2.

NOTE 2: Since first CLMS-FIXED message group can carry 19 octets of CB information and subsequent groups 16 octets of new data, 34 CLMS-FIXED messages in 6 groups are needed to carry the whole CB message of 88 octets.

6.1.7 MM IWU procedures

The MM procedures of TS 101 863-3 [11] shall apply.

6.1.8 Other IWU procedures

Other IWU procedures shall be done according to TS 101 863-3 [11].

6.1.9 Message mappings SM MO and SM MT services

6.1.9.1 UMTS to DECT

Table 3: List of mapped messages

Item No.	UMTS message	Status in UMTS	DECT message	Status in E.2	Reference	Map status	NOTE
1	CM-service-accept	M	CC-CONNECT	M	6.1.9.1.1	C301	(CS domain)
1a	SERVICE ACCEPT	M	CC-CONNECT	M	6.1.9.1.1a	C301	(PS domain)
2	CP-DATA	M	IWU-INFO	M	6.1.9.1.2	M	
3	CP-ACK	M	IWU-INFO	M	6.1.9.1.3	C303	
4	CP-DATA	M	CC-SETUP	M	6.1.9.1.4	C302	(see note)
5	CP-ERROR	M	CC-RELEASE-COM	M	6.1.9.1.5	M	
6	CP-ACK	M	CC-RELEASE	M	6.1.9.1.6	C304	
C301: If SM MO supported then M else N/A. C302: If SM MT supported then M else N/A. C303: If External Handover supported then M else O. C304: If SM MT supported then O else N/A. NOTE: The reception of CP-DATA to the FP IWU initiates the CC connection setup procedure. When the connection has been established the short message is sent over in the IWU-INFO messages.							

All other message mappings shall be done according to TS 101 863-3 [11].

6.1.9.1.1 CM-service-accept - CC-CONNECT

Table 4

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CM-service-accept	**CC-CONNECT**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Skip Indicator	Transaction identifier	TS 101 863-3 [11], 8.1.24	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4	-	IWU-attributes		-	
5	-	Call attributes		-	
6	-	Connection attributes		-	
7	-	Repeat indicator		-	
8	-	Facility		-	
9	-	Repeat indicator		-	
10	-	Progress indicator		-	
11	-	"Display"		-	
12	-	Signal		-	
13	-	Feature indicator		-	
14	-	Network parameter		-	
15	-	Ext h/o indicator		-	
16	-	Terminal capability		-	
17	-	Transit delay		-	
18	-	Window size		-	
19	-	Repeat Indicator		-	
20	-	IWU-TO-IWU		-	
21	-	IWU-Packet		-	
22	-	Escape to proprietary		-	

6.1.9.1.1a SERVICE ACCEPT - CC-CONNECT

Table 4a

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	SERVICE ACCEPT (TS 124 008 [29], clause 9.4.21)	**CC-CONNECT**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Skip Indicator	Transaction identifier	TS 101 863-3 [11], 8.1.24	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4	-	IWU-attributes		-	
5	-	Call attributes		-	
6	-	Connection attributes		-	
7	-	Repeat indicator		-	
8	-	Facility		-	
9	-	Repeat indicator		-	
10	-	Progress indicator		-	
11	-	"Display"		-	
12	-	Signal		-	
13	-	Feature indicator		-	
14	-	Network parameter		-	
15	-	Ext h/o indicator		-	
16	-	Terminal capability		-	
17	-	Transit delay		-	
18	-	Window size		-	
19	-	Repeat Indicator		-	
20	-	IWU-TO-IWU		-	
21	-	IWU-Packet		-	
22	-	Escape to proprietary		-	

6.1.9.1.2 CP-DATA - IWU-INFO

Table 5

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CP-DATA	**IWU-INFO**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.1.2	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4		Portable Identity		-	
5	-	MMS-Generic-Header	7.1.6	I	(see note 1)
6	-	MMS-Object-Header	7.1.7	I	
7	-	Repeat Indicator		-	
8	-	MMS-Extended-Header		-	
9	-	Repeat Indicator		-	
10	-	Time-Date		-	
11	-	Calling Party Number		-	
12	-	Repeat Indicator		-	
13	-	Called Party Number		-	
14	-	Called Part Subaddress		-	
15	-	Segmented Info		I	(see note 2)
16	-	Repeat Indicator		-	
17	-	Alphanumeric		-	
18	-	Repeat Indicator		-	
19	CP-User data	IWU-TO-IWU	6.1.10.1.2	M	
20	-	IWU-PACKET		-	
21	-	Escape to proprietary		-	

NOTE 1: The <MMS Command type> field shall have value '00000'B "MMS-SEND".
NOTE 2: If the upper level message to be transmitted in between FP and PP is larger than the segmenting requirements the FP IWU shall segment the message to necessary segments. In this case the <<Segmented Info>> information element is used.

6.1.9.1.3 CP-ACK - IWU-INFO

Table 6

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CP-ACK	**IWU-INFO**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.1.2	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4		Portable Identity		-	
5	-	MMS-Generic-Header	7.1.6	I	(see note)
6	-	MMS-Object-Header	7.1.7	I	
7	-	Repeat Indicator		-	
8	-	MMS-Extended-Header		-	
9	-	Repeat Indicator		-	
10	-	Time-Date		-	
11	-	Calling Party Number		-	
12	-	Repeat Indicator		-	
13	-	Called Party Number		-	
14	-	Called Part Subaddress		-	
15	-	Segmented Info		-	
16	-	Repeat Indicator		-	
17	-	Alphanumeric		-	
18	-	Repeat Indicator		-	
19	-	IWU-TO-IWU		-	
20	-	IWU-PACKET		-	
21	-	Escape to proprietary		-	
NOTE: The <MMS Command type> field shall have value '00011'B "MMS-SEND-RPY".					

6.1.9.1.4 CP-DATA - CC-SETUP

Table 7

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CP-DATA	**CC-SETUP**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.1.2	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4	-	Portable identity		I	(see note 2)
5	-	Fixed Identity		I	(see note 3)
6	-	Basic service	7.1.2	I	
7	-	Cipher info		I	
8	-	Iwu attributes	7.1.3	I	(see note 4)
9	-	call attributes	7.1.4	I	(see note 4)
10	-	Connection attributes	7.1.5	I	(see note 4)
11	-	Terminal capability	5.5.4	I	(see note 4)
12	CP User Data	-		I	(see note 1)
NOTE 1: The field is mapped into the {IWU-INFO} message in clause 6.1.9.1.2. NOTE 2: The portable identity is the one which was used in the paging procedure as TS 101 863-3 [11]. NOTE 3: The fixed identity is generated locally in FP. NOTE 4: The presence of these information elements in the DECT message is not required although the default values have been given.					

6.1.9.1.5 CP-ERROR - CC-RELEASE-COM

Table 8

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CP-ERROR	**CC-RELEASE-COM**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.1.2	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4	CP-Cause	Release Reason	6.1.11.1.1	O	
5	-	Display		-	
6	-	IWU-TO-IWU		-	
7	-	IWU-PACKET		-	

6.1.9.1.6 CP-ACK - CC-RELEASE

Table 9

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	CP-ACK	**CC-RELEASE**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.1.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.1.2	M	
3	Message type	Message Type	TS 101 863-3 [11], 8.1.3	M	
4	-	Release Reason		I	(see note)
5	-	Display		-	
6	-	IWU-TO-IWU		-	
7	-	IWU-PACKET		-	
NOTE: The Release Reason used is '0E'(hex), "partial release".					

6.1.9.2 DECT to UMTS

Table 10: List of mapped messages

Item No.	DECT message	Status in E.2	UMTS message	Status in UMTS	Reference	Map status	NOTE
1	CC-SETUP	M	CM-service request	M	6.1.9.2.1	C1001	(CS domain)
1a	CC-SETUP	M	SERVICE REQUEST	M	6.1.9.2.1a	C1001	(PS domain)
2	IWU-INFO	M	CP-DATA	M	6.1.9.2.2	M	
3	CC-RELEASE	M	CP-ERROR	M	6.1.9.2.3	C1002	
3	CC-RELEASE	M	CP-ACK	M	6.1.9.2.4	C1003	
4	CC-RELEASE-COM	M	CP-ERROR	M	6.1.9.2.5	M	
C1001: If SM MO supported then M else N/A. C1002: If SM MT supported then M else N/A. C1003: If SM MO supported and CP-ACK transmission pending then M else N/A (see clause 6.1.1.4).							

All other message mappings are done according to TS 101 863-3 [11].

6.1.9.2.1 CC-SETUP - CM-service request

Table 11

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	CC-SETUP	**CM service request**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1	M	
2	Transaction identifier	Skip Indicator	TS 101 863-3 [11], 8.1.24	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Portable identity	Mobile Identity	TS 101 863-3 [11], 8.1.16	M	
5	Fixed identity	-		-	
6	Basic service	CM service type	6.1.10.2.1	M	
7	Basic service	Mobile station classmark 2	-	M	(see note 2)
8	Iwu attributes	-	7.1.3	I	(see note 1)
9	repeat indicator	-		-	
10	call attributes	-	7.1.4	I	(see note 1)
11	repeat indicator	-		-	
12	Connection attributes	-	7.1.5	I	(see note 1)
13	Cipher info	Cipher key sequence number	TS 101 863-3 [11], 8.2.13	M	
14	Network assigned identity	Mobile identity	TS 101 863-3 [11], 7.2.2	M	
15	Terminal capability	-	5.5.4	I	(see note 1)
NOTE 1: The presence of these information elements in the DECT message is not required although the default values have been given.					
NOTE 2: Generated locally, see TS 101 863-3 [11], clause 6.1.2.3.					

6.1.9.2.1a CC-SETUP - SERVICE REQUEST

Table 11a

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	CC-SETUP	**SERVICE REQUEST**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1	M	
2	Transaction identifier	Skip Indicator	TS 101 863-3 [11], 8.1.24	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Portable identity	Mobile station identity (TS 124 008 [29], 10.5.1.4)	TS 101 863-3 [11], 8.1.16	M	
5	Fixed identity	-		-	
6	Basic service	Service type	6.1.10.2.1a	M	
7	Iwu attributes	-	7.1.3	I	(see note)
8	repeat indicator	-		-	
9	call attributes	-	7.1.4	I	(see note)
10	repeat indicator	-		-	
11	Connection attributes	-	7.1.5	I	(see note)
12	Cipher info	Cipher key sequence number (TS 124 008 [29], 10.5.1.2)	TS 101 863-3 [11], 8.2.13	M	
13	Network assigned identity	Mobile station identity (TS 124 008 [29], 10.5.1.4)	TS 101 863-3 [11], 7.2.2	M	
14	Terminal capability	-	5.5.4	I	(see note)
NOTE: The presence of these information elements in the DECT message is not required although the default values have been given.					

6.1.9.2.2 IWU-INFO - CP-DATA

Table 12

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	IWU-INFO	**CP-DATA**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.2.2	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Portable Identity	-		-	
5	MMS-Generic-Header	-	7.1.6	I	(see note 1)
6	MMS-Object-Header	-	7.1.7	I	
7	Repeat indicator	-		-	
8	MMS-Extended-Header	-		-	
9	Repeat indicator	-		-	
10	Time/Date	-		-	
11	Repeat indicator	-		-	
12	Calling Party number	-		-	
13	Repeat indicator	-		-	
14	Called party Number	-		-	
15	Called Party Subaddress	-		-	
16	Segmented Info	-		I	(see note 2)
17	Alphanumeric	-		-	
18	Repeat indicator	-		-	
19	IWU-TO-IWU	CP-User data	6.1.10.2.3	M	
20	IWU-PACKET	-		-	
21	Escape to proprietary	-		-	
NOTE 1: The <MMS Command type> field shall have value '0000'B "MMS-SEND".					
NOTE 2: If the upper level message to be transmitted in between FP and PP is larger than the segmenting requirements the FP IWU shall segment the message to necessary segments. In this case the <<Segmented Info>> information element is required.					

6.1.9.2.3 CC-RELEASE - CP-ERROR

Table 13

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	CC-RELEASE	**CP-ERROR**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.2.2	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Release Reason	CP-Cause	6.1.10.2.2	C1301	(see note)
5	Display	-		-	
6	IWU-TO-IWU	-		-	
7	IWU-PACKET	-		-	
NOTE: If not mapped CP-Cause #111 "Protocol error" is used.					
C1301: If Release reason is partial release then I else O.					

6.1.9.2.4 CC-RELEASE - CP-ACK

Table 14

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	CC-RELEASE	**CP-ACK**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1	M	
2	Transaction identifier	Transaction identifier	6.1.11.2.2	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Release Reason	-		-	
5	Display	-		-	
6	IWU-TO-IWU	-		-	
7	IWU-PACKET	-		-	

6.1.9.2.5 CC-RELEASE-COM - CP-ERROR

Table 15

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	CC-RELEASE-COM	**CP-ERROR**			
1	Protocol Discriminator	Protocol Discriminator	6.1.11.2.1.	M	
2	Transaction identifier	Transaction identifier	6.1.11.2.2	M	
3	Message Type	Message type	TS 101 863-3 [11], 8.1.3	M	
4	Release Reason	CP-Cause	6.1.10.2.2	C1501	(see note)
5	Display	-		-	
6	IWU-TO-IWU			-	
7	IWU-PACKET	-		-	
C1501: If Release reason is partial release then I else O. NOTE: If not mapped CP-Cause #111 "Protocol error" is used.					

6.1.10 Information elements mappings, SM MO and SM MT services

6.1.10.1 UMTS to DECT

6.1.10.1.1 CP-Cause - Release Reason

Table 16

Item No.	Information element coding UMTS	Information element coding DECT	Reference	Map status	NOTE
	CP-Cause	**Release Reason**			
1	CP-Cause IEI	ID for Release Reason	TS 101 863-3 [11], 8.1.4	M	
2	Cause code	Release reason code	6.1.11.1.3	M	

6.1.10.1.2 CP-User data- IWU-TO-IWU

See clause 6.1.10.2.3.

6.1.10.2 DECT to UMTS

6.1.10.2.1 Basic service - CM-Service type

Table 17

Item No.	Information element coding DECT	Information element coding UMTS	Reference	Map status	NOTE
	Basic Service	**CM-Service type**			
1	ID for basic service	CM-Service type IEI	TS 101 863-3 [11], 8.1.4	M	
2	Call class	Service type	6.1.11.2.3a	M	

6.1.10.2.1a Basic service - Service type

Table 17a

Item No.	Information element coding DECT	Information element coding UMTS	Reference	Map status	NOTE
	Basic Service	**service type (TS 124 008 [29], clause 10.5.5.20)**			
1	ID for basic service	Service type IEI	TS 101 863-3 [11], 8.1.4	M	
2	Call class	Service type	6.1.11.2.3a	M	

6.1.10.2.2 Release Reason - CP-Cause

Table 18

Item No.	Information element coding DECT	Information element coding UMTS	Reference	Map status	NOTE
	Release Reason	**CP-Cause**			
1	ID for Release Reason	CP-Cause IEI	TS 101 863-3 [11], 8.1.4	M	
2	Release reason code	Cause code	6.1.11.2.4	M	

6.1.10.2.3 IWU-TO-IWU - CP-User data

Table 19

Item No.	Information element coding DECT	Information element coding UMTS	Reference	Map status	NOTE
	IWU-TO-IWU	**CP-User data**			
1	Element identifier	Information element identifier	TS 101 863-3 [11], 8.1.4	M	
2	Length of contents	-		-	(see note 3)
3	-	Length indicator		-	(see note 3)
4	S/R	-		-	(see note 1)
5	protocol discriminator	-		-	(see note 2)
6	IWU-TO-IWU information	RPDU		M	(see note 4)

NOTE 1: Field uses default value '1'B; "Transmission of Message".
NOTE 2: The Field uses default value '010100'B; "MMS User Data".
NOTE 3: The length mapping cannot be done since the UMTS length is the CP frame length whereas the DECT length may be the IWU-TO-IWU segment length. The RPDU length information can be found in the RPDU header or derived from the CP user data length indicator if needed by the interworking function.
NOTE 4: The complete UMTS SM-RP layer RPDU received from the CP User data element as defined in TS 124 011 [30] shall be transparently mapped to the IWU-TO-IWU information element in the FP and PP IWU beginning with the first octet of the RPDU carried in the first octet of the IWU-TO-IWU information field. No segmentation is done in the interworking unit if the RPDU message length exceeds the supported length limitation of the DECT C-plane messages. This is the task of DECT network layer as defined in LRMS EN 300 757 [35].

6.1.11 Fields in information element coding, SM MO and SM MT services

6.1.11.1 UMTS to DECT

6.1.11.1.1 Protocol discriminator - protocol discriminator

Table 20

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	protocol discriminator (TS 124 007 [28], clause 11.2.3.1.1)	**protocol discriminator**			
1	'1001'B	'0011'B		M	"SMS" to "CC"

6.1.11.1.2 Transaction ID - Transaction Identifier

The SMS Transaction Flag shall be mapped transparently to the DECT Transaction Flag.

The DECT transaction value shall have value '111'B and UMTS SMS transaction ID shall be mapped transparently into the first three bits (bits 3, 2 and 1) of the DECT extended transaction value. Bit 4 of the transaction ID shall have the value of the Transaction Flag. Bits 8, 7, 6 and 5 shall have value '0010'B.

6.1.11.1.3 Cause value - Release reason code

Table 21

Item No.	Message coding UMTS	Message coding DECT	Reference	Map status	NOTE
	Cause value (#)	**Release reason code (hex)**			
1	17 Network failure	0F Unknown		M	
2	22 Congestion	31 Overload		M	
3	81 Invalid transaction identifier value	02 Unknown transaction identifier		M	
4	95 Semantically incorrect message	04 Invalid information element contents		M	
5	96 Invalid mandatory information	03 Mandatory information element missing		M	
6	97 Message type non-existent or not implemented	01 Unexpected message		M	
7	98 Message not compatible with the short message protocol state	01 Unexpected message		M	
8	99 Information element non-existent or not implemented	04 Invalid information element contents		M	
9	111 Protocol error, unspecified	0F Unknown		M	

6.1.11.2 DECT to UMTS

6.1.11.2.1 protocol discriminator - protocol discriminator

See clause 6.1.11.1.1.

6.1.11.2.2 Transaction ID - Transaction ID

See clause 6.1.11.1.2.

6.1.11.2.3 Call class - service type (CS)

Table 22

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	Call class	**Service type**			
1	'0100'B	'0100'B		M	"Messaging call setup" to "SMS"

6.1.11.2.3a Call class - service type (PS)

Table 22a

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	Call class	**Service type (TS 124 008 [29], clause 10.5.5.20)**			
1	'0100'B	'000'B		M	"Signalling"

6.1.11.2.4 Cause value-Cause - Release reason code

Table 23

Item No.	Message coding DECT	Message coding UMTS	Reference	Map status	NOTE
	Release reason code (hex)	**Cause value (#)**			
1	31 Overload	22 Congestion		M	
2	02 Unknown transaction identifier	81 Invalid transaction identifier value		M	
3	04 Invalid information element contents	95 Semantically incorrect message		M	
4	03 Mandatory information element missing	96 Invalid mandatory information		M	
5	01 Unexpected message	97 Message type non-existent or not implemented		M	
6	04 Invalid information element contents	99 Information element non-existent or not implemented		M	
7	0F Unknown	111 Protocol error, unspecified		M	

Other DECT release reason values shall be mapped into CP-Cause #111 Protocol error unspecified.

6.1.12 Information mapping, CB service

6.1.12.1 UMTS to DECT

Table 24: List of mapped messages

Item No.	UMTS CB message	DECT message	Reference	Map status	NOTE
1	-	CLMS-FIXED address section		-	(see note 1)
2	CB message	CLMS-FIXED data section 1	6.1.13.1	M	(see note 3)
3	CB message (cont.)	CLMS-FIXED data section 2	6.1.13.2	C2401	(see notes 2 and 3)
4	CB message (cont.)	CLMS-FIXED other data sections	6.1.13.3	M	(see note 3)
C2401: If this CLMS-FIXED message is the second segment of the first group then M else I (see note 2). NOTE 1: Default values are given in clause 6.1.6. NOTE 2: If this CLMS-FIXED message is not the second segment of the first multisegment group then mapping shall be done as specified in clause 6.1.13.3. NOTE 3: The information carried in the same CB message.					

6.1.13 Information elements mappings CB service

6.1.13.1 CB message - CLMS-FIXED data section 1

Table 25

Item No.	UMTS Message	DECT message	Reference	Map status	NOTE
	CB message	**CLMS-FIXED data section 1**			
1	-	Data (Octet 2)	6.1.6	I	
2	Serial Number (Octets 1 to 2)	Data (Octet 3-4)	6.1.14.1	M	
3	Data Coding Scheme (Octet 5)	Data (Octet 5)	6.1.14.1	M	

6.1.13.2 CB message - CLMS-FIXED data section 2

Table 26

Item No.	UMTS Message	DECT message	Reference	Map status	NOTE
	CB message	**CLMS-FIXED data section 2**			
1	Message Identifier (Octets 3 to 4)	Data (Octet 2-3)	6.1.14.1	M	
2	Page Parameter (Octet 6)	Data (Octet 4)	6.1.14.1	M	
3	Message Content (Octets 7)	Data (Octet 5)	6.1.14.1	M	

6.1.13.3 CB message - CLMS-FIXED other data sections

Table 27

Item No.	UMTS Message	DECT message	Reference	Map status	NOTE
	CB message	**CLMS-FIXED data sections**			
1	Message content (4 octet data blocks)	Data	6.1.14.1	M	(see note)
NOTE:	The Message Contents is segmented to 4 octet blocks beginning from octet 8 for each CLMS-FIXED message. If the number of blocks in first group exceeds 3, see clause 6.1.6.				

6.1.14 Fields mappings CB service

6.1.14.1 General field mapping rule

The field shall be carried transparently inside the data part of the DECT message.

6.2 PP C-plane SM MO IWU procedures

This clause describes the IWU functionality between SM-RP protocol entity and CC entity. A general example of message and primitive flows is illustrated in annex D.

If external handover is supported the requirements regarding the MMSP state machine as defined in the annex B shall be supported.

NOTE: The FP informs about the external handover support via Broadcast attributes bit a45.

6.2.1 Connection establishment and data transfer

Upon receipt of MNSMS-EST-req from SM-RP layer the PP IWU shall issue MNCC-SETUP-req containing <<Basic service>> information element with values described in clause 7. The IWU shall wait for MNCC-CONNECT-ind primitive before it proceeds with data transmission.

Upon receipt of the MNCC-CONNECT-ind primitive the PP IWU shall proceed with submitting MNCC-IWU-INFO-req containing the RPDU received previously in the MNSMS-EST-req primitive. The RPDU shall be submitted in the <<IWU-TO-IWU>> parameter containing the necessary coding suggested in clause 6.1.10.2.3. The <<MMS-Generic-Header>> shall contain value "MMS-SEND" in the <MMS Command type> field.

The PP may request for MMSP layer acknowledgements by having value '11' or '10' in the <Reply requested> field of the <<MMS-Generic Header>> information element in the {IWU-INFO} message if External handover is supported.

Upon receipt of MNCC-IWU-INFO-ind with value "MMS-SEND-RPY" in the <MMS Command type> field of the <<MMS-Generic-Header>> field no action shall be taken towards SM-RP. The information shall be used as defined in annex B.

Upon receipt of {IWU-INFO} message coded as {MMS-SEND} and reflected by MNCC-IWU-INFO-ind the PP IWU shall issue the contents of the <<IWU-TO-IWU>> (the SM-RP frame) parameter with the MNSMS-DATA-ind to the SM-RP layer.

6.2.2 Connection release and abnormal situations

Upon receipt of MNSMS-REL-req from the SM-RP layer the PP IWU shall issue MNCC-RELEASE-req to the CC layer if the CC connection is still present. If connection has already been released no action is take upon receipt of MNSMS-REL-req. The cause code may be mapped to the CC release reason code as described in clause 6.1.11.1.3. The release should be timed such that the previous {IWU-INFO} message transfer has been successfully finished.

Upon receipt of MNCC-REJECT-ind from CC the PP IWU shall issue MNSMS-ERROR-ind to the SM-RP layer. The CC release reason code may be mapped to the cause code.

Upon receipt of MNSMS-ABORT-req from the SM-RP layer the PP IWU shall issue MNCC-REJECT-req to the CC layer. The cause code may be mapped to the CC release reason code as illustrated in clause 6.1.11.1.3.

If the PP CC entity releases the connection without SM-RP layer issuing a primitive issuing either MNCC-RELEASE-req or MNCC-REJECT-req the PP IWU shall issue a MNSMS-ERROR-Ind to the SM-RP layer.

6.3 PP C-plane SM MT IWU procedures

This clause describes the IWU functionality between SM-RP protocol entity and CC entity. A general example of message and primitive flows is illustrated in annex D.

6.3.1 Connection establishment and data transfer

Upon receipt of MNCC-SETUP-ind from CC containing <<Basic service>> information with values described in clause 7 the PP IWU shall:

- if no SM-RP layer functionality is present the IWU shall issue MNCC-REJECT-req with release reason "Service not implemented";
- or if SM-RP functionality is present the IWU shall issue MNCC-CONNECT-req primitives.

No action shall be taken upon receipt of MNCC-CONNECT-ACK-ind primitive.

Upon receipt of MNCC-IWU-INFO-ind the PP IWU shall issue the contents of the <<IWU-TO-IWU>> (RPDU) parameter with the MNSMS-EST-ind to the SM-RP layer.

Upon receipt of MNSMS-DATA-req containing a RP frame (RPDU) the PP IWU shall issue MNCC-IWU-INFO-req with value "MMS-SEND" in the <MMS Command type> field of the <<MMS-Generic-Header>> with the RPDU in the <<IWU-TO-IWU>> parameter with the coding suggested in clause 6.1.10.2.3.

The PP may request for MMSP layer acknowledgements by having value '11' or '10' in the <Reply requested> field of the <<MMS-Generic Header>> information element in the {IWU-INFO} message if External handover is supported.

6.3.2 Connection release and abnormal situations

Upon receipt of MNSMS-REL-req from the SM-RP layer the PP IWU shall issue MNCC-RELEASE-req to the CC layer if the CC connection is still present. If connection has already been released no action shall taken upon receipt of MNSMS-REL-req. The cause code may be mapped to the CC release reason code as described in clause 6.1.11.1.3. The release should be timed such that the previous {IWU-INFO} message transfer has been successfully finished.

Upon receipt of MNSMS-ABORT-Req from the SM-RP layer the PP IWU shall submit MNCC-REJECT-req primitive to the PP CC.

Upon receipt of MNCC-REJECT-ind the PP IWU shall issue MNSMS-ERROR-ind to the SM-RP layer with a cause code optionally mapped from the MNCC-REJECT-ind primitive.

No action shall be taken upon receipt of MNCC-RELEASE-cfm primitive.

Upon receipt of MNCC-RELEASE-ind primitive the PP IWU shall response with MNCC-RELEASE-res to the PP CC to indicate the acceptance of the release.

6.4 Summary of primitive mappings in SM MO and SM MT cases

The following table illustrates the primitive mappings between the SM-RP and PP CC. The detailed information about the procedures can be found in clauses 6.3 and 6.2.

Table 28

Item No.	The direction of the primitives in PP IWU	MO/MT-SMS primitives	DECT PP CC primitives	NOTE
1	SM-RP => PP IWU => CC	MNSMS-ABORT-Req (Cause)	MNCC-REJECT-Req (Release Reason)	(see note 2)
3	SM-RP => PP IWU => CC	MNSMS-DATA-Req (MT RPDU)	MNCC-IWU-INFO-Req (MT RPDU)	(see note 3)
4	SM-RP <= PP IWU <= CC	MNSMS-DATA-Ind (MO RPDU)	MNCC-IWU-INFO-Ind (MO RPDU)	(see note 3)
5	SM-RP => PP IWU => CC	MNSMS-EST-Req (MO RPDU)	MNCC -SETUP-Req MN-CC-IWU-INFO-Req(MO RPDU)	(see notes 1 and 3)
6	SM-RP <= PP IWU <= CC	MNSMS-EST-Ind (MT RPDU)	MNCC -SETUP-Ind MNCC-IWU-INFO-Ind (MT RPDU)	(see note 1) (see note 3)
7	SM-RP <= PP IWU <= CC	MNSMS-ERROR-Ind (Cause)	MNCC- REJECT-Ind (Release Reason)	(see note 2)
8	SM-RP => PP IWU => CC	MNSMS-REL-Req (Cause)	MNCC-RELEASE-Req (Release Reason)	(see note 2)

NOTE 1: Two primitives are triggered by or from one upper layer primitive.
NOTE 2: mapping between release reason and Cause code may take place.
NOTE 3: The RPDU is carried intact inside the IWU-INFO with MMS-SEND message coding user field. The MMS SEND message shall contain the necessary coding to indicate this.

6.5 PP C-plane CB IWU procedures

Upon receipt of the MNDL-UNITDATA-ind from the CLMS entity the PP IWU shall first check the value of the octet 1 of the received message for first group indicated by the <F> field and group numbering indicated by the <group numbering> field. The first group of the multisection group is recognized by <F bit> field value '1'B: if the multisection group number is larger than 0 then the PP IWU shall wait for additional groups. The CB Serial Number carried in the octets 2 and 3 of the groups shall be used to guarantee that the CLMS-FIXED groups are belonging to the same CB message. When all sections have been received the PP IWU shall combine the group sections into one CB message. The octet 1 of the first group and octets 1 to 4 of the subsequent groups shall be ignored. When the complete message has been assembled it shall be forwarded to the CB application.

If a section is missing the PP IWU shall discard the received information and shall start the message reception again by waiting for a message having value '1'B in the <F> field.

7 Interworking connection types

7.1 Connection type definitions

7.1.1 General

The following coding are default codings for the connection establishment of the SM MO and SM MT services.

7.1.2 <<BASIC SERVICE>> coding

Table 29: <<Basic service>> default coding

Octet	Information element field	Field value	NOTE
2	<Call Class> <Basic Service>	'0100'B '0110'B	"Message Call Setup" "UMTS IWP SMS"

7.1.3 <<IWU-ATTRIBUTES>> default coding

The profile defined <<IWU ATTRIBUTES>> coding shall be used. The structure is as described in the EN 300 175-5 [5], clause 7.7.21 with coding value '01' in the <Coding standard> field. Only first four octets are used. The Profile subtype shall have the following codings:

Profile subtype (octet 4):

Bits 4 3 2 1 Meaning

0 0 0 1 SMS SM MO

0 0 1 0 SMS SM MT

All other values reserved.

Table 30: <<iwu attributes>> default coding

Octet	Information element field	Field value	NOTE
3	<Coding standard> <Profile>	'01'B '01011'B	"Profile defined coding" "UMTS messaging"
4	Negotiation indicator Profile Subtype	'000'B '0001'B or '0010'B	"Negotiation not possible" "SMS SM MT or SMS SM MO" (see note)
NOTE: The coding shall be selected according to the service, either MT or MO.			

7.1.4 <<CALL ATTRIBUTES>> default coding

Table 31: <<Call attributes>> default coding

Octet	Information element field	Field value	NOTE
3	<Coding standard> <Network layer attributes>	'00'B '01000'B	"DECT standard coding" "DECT/UMTS IWP"
4	<C-plane class> <C-plane routing>	'010'B '0000'B	Class A link; shared Cs only

7.1.5 <<CONNECTION ATTRIBUTES>> default coding

Table 32: <<Connection attributes>> default coding

Octet	Information element field	Field value	NOTE
3	<Symmetry> <Connection identity coding>	'001'B '0000'B	"Symmetric connection" "Unknown"
4	<Target bearers>	'00000'B	"NO U-plane"
5	<Mac slot size> <Mac service>	- -	(see note) (see note)
6	<Cf channel attributes>	'000'B	"Cf never (Cs only)"
NOTE:	These values have no meaning to the profile.		

7.1.6 <<MMS Gen Hdr>> coding

Table 33: <<MMS Generic Header>> default coding

Octet	Information element field	Field value	NOTE
3	<MMS Command type>	'00000'B or '00001'B	"MMS-SEND" or "MMS-SEND-RPY"
3	<Reply requested>	'11'B or '10'B	"Reply requested from the End entity and MCE" or "Reply not requested form the End entity and not from MCE"
4	<MMS message identifier>	-	(see note)
NOTE:	The value is ignored.		

7.1.7 <<MMS Obj Hdr>> coding

Table 34: <<MMS Object Header>> default coding

Octet	Information element field	Field value	NOTE
3	<Length Description>	'01'B	"No user data length specified"
3	<Number of length octets>	-	(see note)
4	<Source user data category>	'11'B	"Other user data"
4	<Source user data transfer encoding>	'00000'B	"No transfer encoding"
5	<Source user data type>	'0100010'B	"Encapsulated: UMTS SMS"
NOTE:	The value is ignored.		

Annex A (normative): Interworking with UMTS Subscriber Identity Module (USIM) application

The interworking between the (U)SIM card and the SMS application in terms of the storing of the SMS message and SMS related information shall be done as defined in TS 131 102 [34]. Other SIM related procedures shall be done as specified in the TS 101 863-3 [11].

The interface between a Data Terminal Equipment (DTE) and DECT PP shall fulfil the requirements of TS 127 005 [33] if a DTE is used for SMS control.

Annex B (normative): MMSP requirements for SM MO external handover support

B.1 Introduction

This annex describes the procedures for the SM MO SMS transfer used by the MMSP entity over the CC entity link if external handover is supported in both PP and FP. These procedures as well as the MMSP application structure is required to guarantee the transmission of the SMS message by provision of acknowledgements and retransmissions on the MMSP layer. The state machine as described here shall be a function of the PP.

B.2 General rules

The procedures may be activated only if the CC entity is in a active state.

If the CC connection is released in the middle of the SMS message transfer procedure either with normal or abnormal release the procedure are interrupted, the idle state is returned, buffered messages are discarded and the application shall be informed about the situation as defined in clause B.3.5.

If the connection is released due to external handover the procedures shall be continued over the new CC connection.

The field <Reply requested> in <<MMS GENERIC HEADER>> information element of a {MMS-SEND} message shall have value '10'B; "Reply requested from the End entity" or '11'B; "Reply requested from the Message Control Entity (MCE) and end entity".

B.3 MMSP state machine

For the provision of retransmissions the following state machine shall be required.

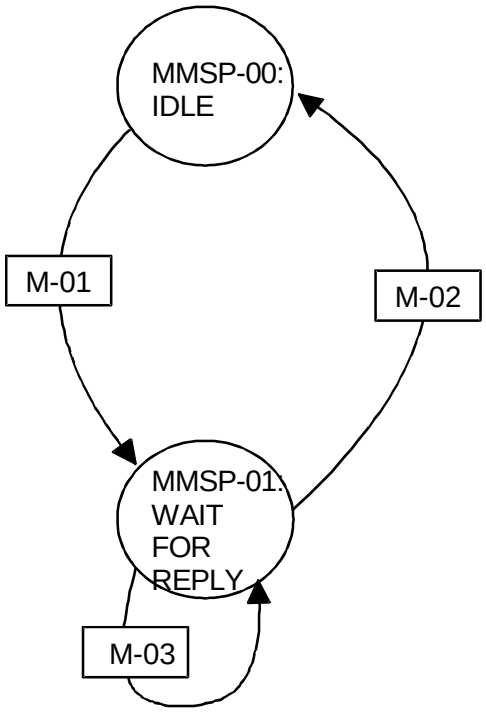


Figure B.1: The MMSP state machine

B.3.1 MMSP states

B.3.1.1 MMSP state MMSP-00: "IDLE"

This state exists when the MMSP entity is in a idle mode or when the MMSP message transfer end in a normal way.

B.3.1.2 MMSP state MMSP-01: "WAIT FOR REPLY"

This state exists when the MMSP entity has initiated a transfer of a MMSP message and is waiting a reply message.

B.3.2 MMSP timers

<TMMSP.01> timer shall contain the retransmission timer value. This timer shall have the same value as the UMTS SM-CP layer TC1N [37]. If the timer expires the MMSP message is retransmitted and the state MMSP-01 "WAIT FOR REPLY" is re-entered.

B.3.3 MMSP retransmission counter

The maximum number of {MMS-SEND} message retransmissions is an implementation option as defined in the UMTS SM-CP layer definitions, TS 124 011 [30]. However, the number of retransmission should be the same as in the UMTS SM-CP layer.

B.3.4 MMSP state transitions

M-01: The {MMS-SEND} message was sent. The timer <TMMSP.01> is set. Next state is MMSP-01.

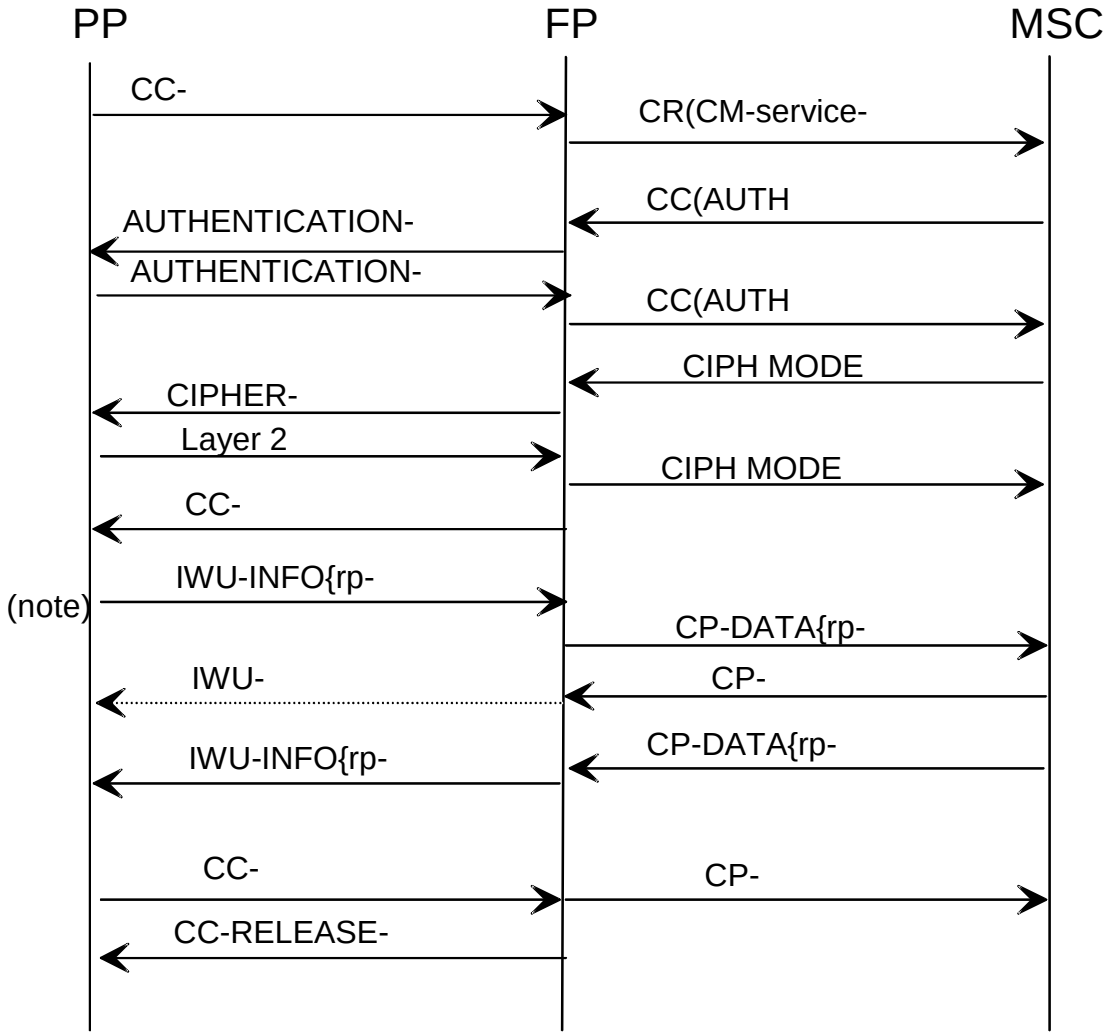
M-02: The {MMS-SEND-RPY} message was received. The timer <TMMSP-01> is stopped. Next state is MMSP-00.

M-03: If the {MMS-SEND-RPY} message was not received before the timer expiry of the <TMMSP.01> timer the {MMS-SEND} message shall be resent. The MMSP-01 state is re-entered. If the maximum amount of the retransmissions is reached as indicated by retransmission counter the application shall be informed about the situation as defined in clause B.3.5 and MMSP-00 state shall be entered.

B.3.5 Abnormal situations

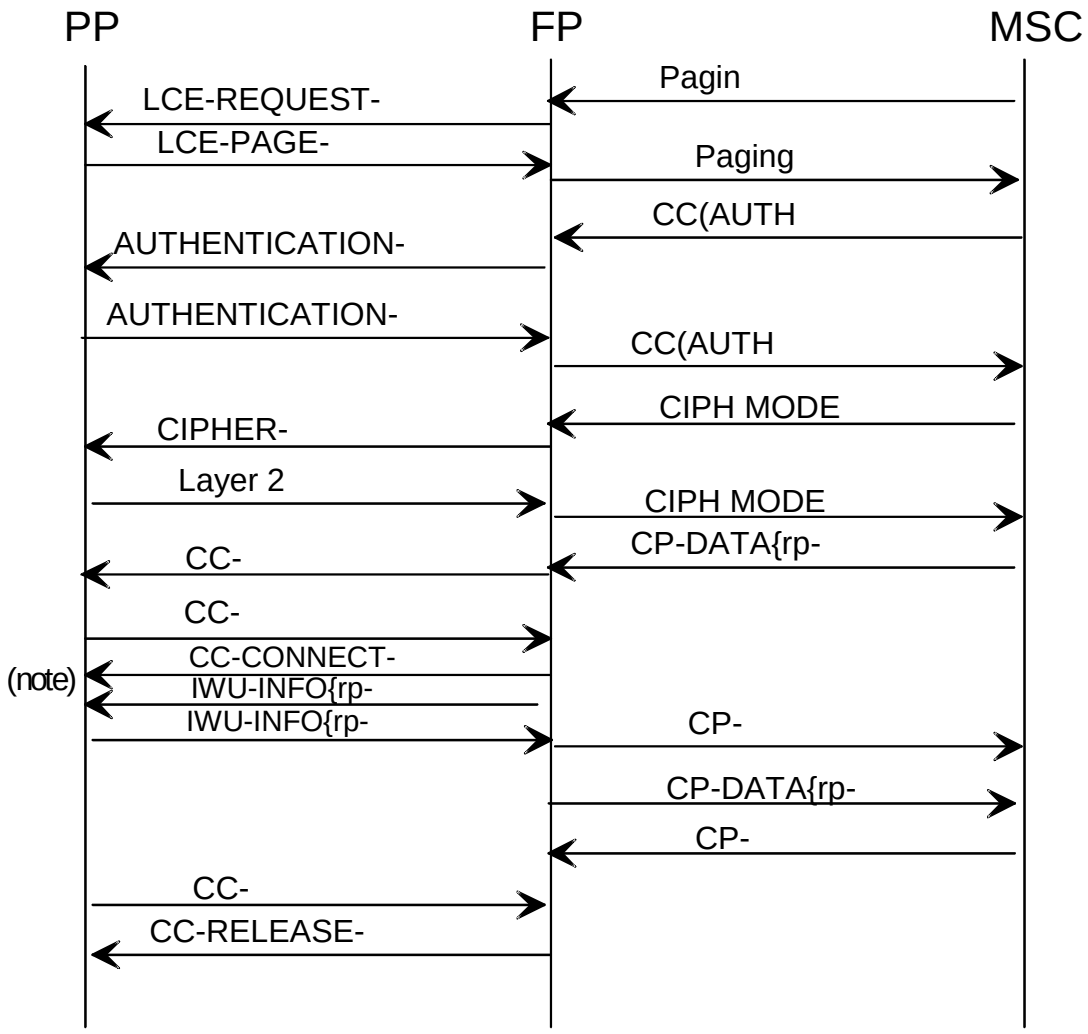
Upon transmission errors the MMSP layer shall release the CC connection, if it has not yet been released, by issuing a MNCC-REJECT-req primitive and issues a MNSMS-ERROR-ind to the SM-RP layer.

Annex C (informative): Signalling charts (CS domain)



NOTE: The UMTS short message has to be segmented into multiple IWU-INFO messages.

Figure C.1: Mobile originated SMS (DECT/UMTS interworking mobile) - CP layer interworking



NOTE: The UMTS short message has to be segmented into multiple IWU-INFO messages.

Figure C.2: Mobile terminated SMS (DECT/UMTS interworking) - CP layer interworking

Annex D (informative):
An example of primitives and message flows (CS domain)

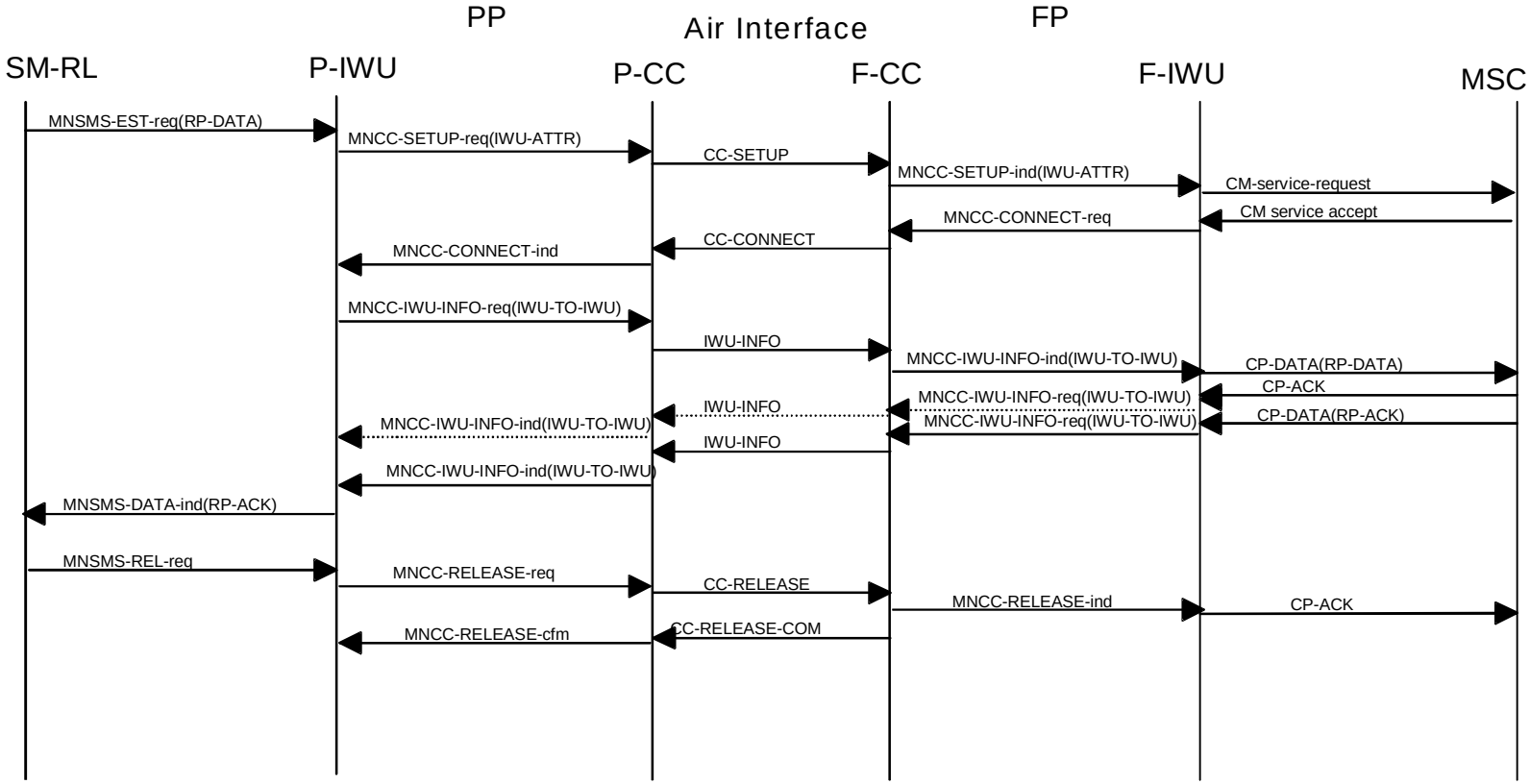


Figure D.1: Mobile originated SMS

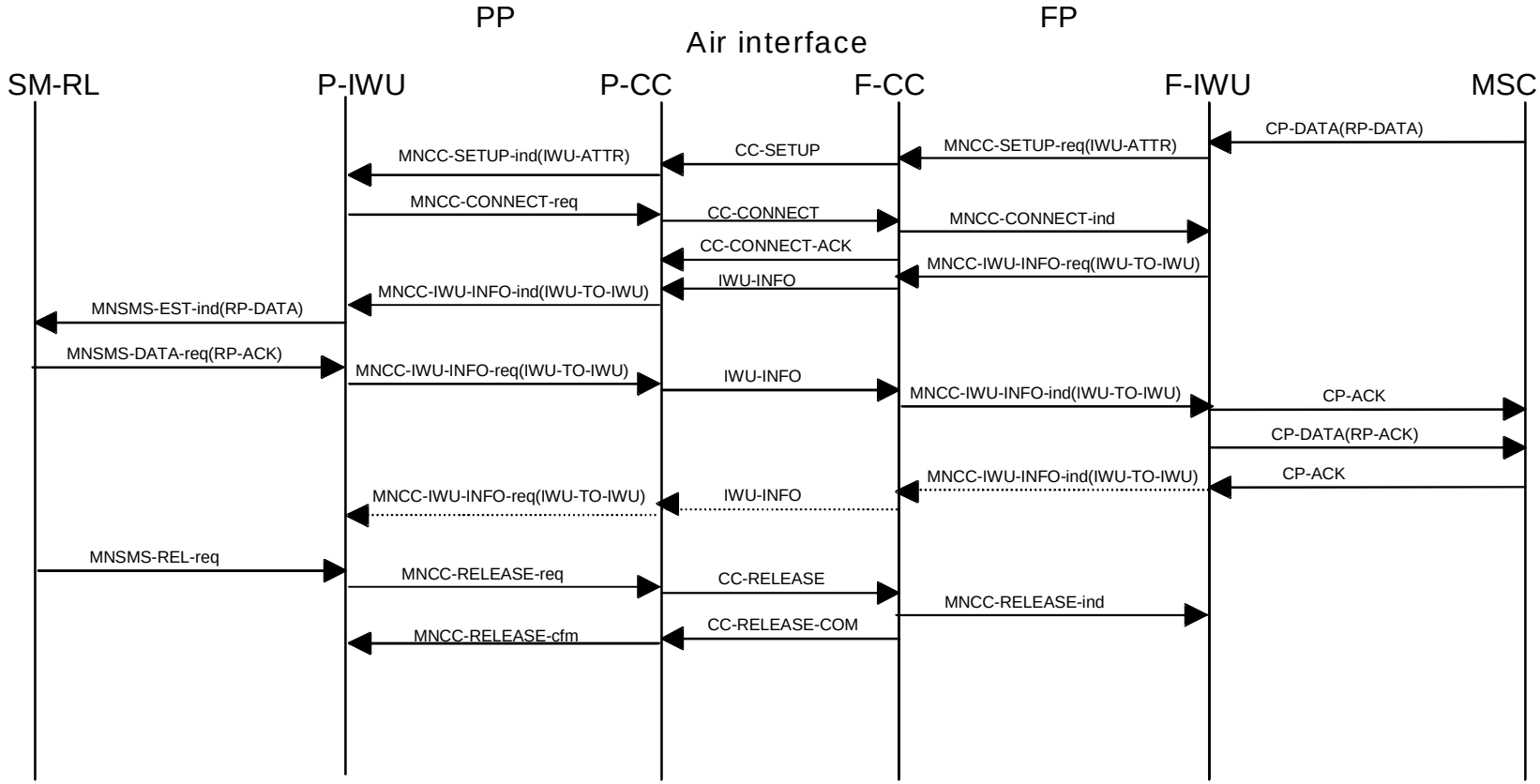


Figure D.2: Mobile terminated SMS

Annex E (informative): Bibliography

- ETSI TS 101 863-2: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 2: CN-FP interworking".
- ETSI TS 101 863-4: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 4: Supplementary services".
- ETSI TS 101 863-6: "Digital Enhanced Cordless Telecommunications (DECT); DECT/UMTS Interworking Profile (IWP); Part 6: Packet switched data".
- ITU-T Recommendation Q.6xx series: "International Telecommunication Union; Interworking of signalling systems".

History

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