

ETSI TS 101 376-4-13 V3.2.1 (2011-02)

Technical Specification

**GEO-Mobile Radio Interface Specifications (Release 3);
Third Generation Satellite Packet Radio Service;
Part 4: Radio interface protocol specifications;
Sub-part 13: Radio Resource Control (RRC) protocol;
lu Mode;
GMR-1 3G 44.118**

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ETSI TS 101 376-4-13 V3.2.1 (2011-02)

<https://standards.iteh.ai/catalog/standards/etsi/9cb1003a-629f-4b24-91fa-bef9585a55ee/etsi-ts-101-376-4-13-v3-2-1-2011-02>



Reference

RTS/SES-00315-4-13

Keywords3G, GMPRS, GMR, GPRS, GSM, GSO, MES,
mobile, MSS, radio, satellite, S-PCN**ETSI**650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

(<https://standards.iteh.ai>)
Document Preview

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

http://portal.etsi.org/chaicor/ETSI_support.asp

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.
All rights reserved.

DECTTM, PLUGTESTSTM, UMTSTM, TIPHONTM, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

3GPPTM is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

LTETM is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners.

GSM[®] and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	14
Foreword.....	14
Introduction	15
1 Scope	17
1.1 General	17
1.2 Scope of the Technical Specification	17
1.3 Application to the interface structures.....	17
1.4 Structure of layer 3 procedures.....	17
1.5 Void.....	17
1.6 Applicability of implementations	17
2 References	18
2.1 Normative references	18
2.2 Informative references.....	20
3 Definitions, symbols and abbreviations	20
3.1 Definitions.....	20
3.2 Abbreviations	21
3.3 Random values	21
3.4 Specification Notations	22
4 RRC Functions and Services provided to upper layers	22
4.1 RRC Functions	22
4.2 RRC Services provided to upper layers.....	23
5 Services expected from lower layers.....	23
5.1 Services required from layer 2 and physical layers.....	23
5.2 Signalling Radio Bearers.....	23
6 RRC Protocol modes and states	23
6.1 General	23
6.2 Relation between Iu mode and A/Gb mode.....	24
6.2.1 Handover between Iu and A/Gb modes	24
6.2.2 Cell reselection between Iu and A/Gb mode	24
6.2a Relation between GERAN Iu mode RRC and UTRA RRC	24
6.2a.1 Handover between GERAN Iu mode and UTRAN	24
6.2a.2 Cell reselection between GERAN Iu mode and UTRAN	24
6.3 RR modes of operation.....	25
6.4 RRC modes and states	25
6.4.1 RRC-Idle Mode	25
6.4.1.1 General	25
6.4.1.2 Transition from RRC-Idle Mode to RRC-Connected mode.....	25
6.4.2 RRC-Connected mode: RRC-Cell_Shared state	25
6.4.2.1 General	25
6.4.2.2 Transition from RRC-Cell_Shared state to RRC-Idle Mode.....	26
6.4.2.3 Transition from RRC-Cell_Shared state to RRC-Cell_Dedicated state	26
6.4.2.4 Transition from RRC-Cell_Shared state to RRC-GRA_PCH state.....	26
6.4.2.5 Radio resource allocation tasks.....	26
6.4.2.6 RRC connection mobility tasks.....	26
6.4.2.7 MES measurements.....	26
6.4.3 RRC-Connected mode: RRC-Cell_Dedicated state	27
6.4.3.1 General	27
6.4.3.2 Transition from RRC-Cell_Dedicated state to RRC-Cell_Shared state	27
6.4.3.3 Transition from RRC-Cell_Dedicated state to RRC-Idle Mode.....	27
6.4.3.4 Transition from RRC-Cell_Dedicated state to RRC-GRA_PCH state.....	27
6.4.3.5 Radio resource allocation tasks.....	27
6.4.3.6 RRC connection mobility tasks.....	27

6.4.3.7	MES measurements.....	27
6.4.4	RRC-Connected mode: RRC-GRA_PCH state	28
6.4.4.1	General	28
6.4.4.2	Transition from RRC-GRA_PCH state to RRC-Cell_Shared state.....	28
6.4.4.3	Transition from RRC-GRA_PCH state to RRC-Cell_Dedicated state.....	28
6.4.4.4	Radio resource allocation tasks.....	28
6.4.4.5	RRC connection mobility tasks.....	29
6.4.4.6	MES measurements.....	29
6.4.4.7	Transfer and update of system information.....	29
7	Radio Resource Control procedures.....	29
7.1	General	29
7.2	Change of channels in case of handover	29
7.2.1	Change of channel serving SRB1	29
7.2.2	Change of channel serving SRB2	29
7.2.3	Change of channel serving SRB3	30
7.2.4	Change of channel serving SRB4	30
7.3	System information broadcasting	30
7.3.1	General.....	30
7.3.2	Broadcast of Iu mode specific System Information.....	30
7.4	Paging procedure.....	30
7.4.1	General.....	30
7.4.2	Paging initiation in RRC-Idle mode, or RRC-GRA_PCH state.....	30
7.4.2.1	General	30
7.4.2.2	Initiation.....	31
7.4.2.3	Reception of a PAGING INDICATION service primitive	32
7.4.3	Paging initiation in RRC-Cell_Dedicated state.....	32
7.4.4	Abnormal cases.....	33
7.5	RRC Connection management procedures.....	33
7.5.1	RRC connection establishment	33
7.5.1.1	General	33
7.5.1.2	Initiation.....	34
7.5.1.3	RRC CONNECTION REQUEST message contents to set.....	34
7.5.1.4	Reception of an RRC CONNECTION REQUEST message by the GERAN	34
7.5.1.5	T300 timeout	34
7.5.1.6	Abortion of RRC connection establishment.....	35
7.5.1.7	Reception of an RRC CONNECTION SETUP message by the MES	35
7.5.1.8	Cell re-selection	36
7.5.1.9	Invalid RRC CONNECTION SETUP message	37
7.5.1.10	Reception of an RRC CONNECTION REJECT message by the MES	38
7.5.1.11	Invalid RRC CONNECTION REJECT message	38
7.5.2	RRC connection release.....	39
7.5.2.1	General	39
7.5.2.2	Initiation.....	39
7.5.2.3	Reception of an RRC CONNECTION RELEASE message by the MES.....	39
7.5.2.4	Invalid RRC CONNECTION RELEASE message.....	40
7.5.2.5	Cell re-selection or radio link failure	40
7.5.2.6	Reception of an RRC CONNECTION RELEASE COMPLETE message by GERAN	41
7.5.2.7	Unsuccessful transmission of the RRC CONNECTION RELEASE COMPLETE message, acknowledged mode transmission.....	41
7.5.2.8	Detection of loss of dedicated physical channel by GERAN in RRC-Cell_Dedicated state.....	41
7.5.2.9	Failure to receive RRC CONNECTION RELEASE COMPLETE message by GERAN.....	41
7.6	Transmission of MES capability information.....	42
7.6.1	General.....	42
7.6.2	Initiation.....	42
7.6.3	Reception of an MES CAPABILITY INFORMATION message by the GERAN.....	43
7.6.4	Reception of the MES CAPABILITY INFORMATION CONFIRM message by the MES	43
7.6.5	Invalid MES CAPABILITY INFORMATION CONFIRM message.....	43
7.6.6	T304 timeout.....	44
7.7	MES capability enquiry.....	45
7.7.1	General.....	45
7.7.2	Initiation.....	45

7.7.3	Reception of an MES CAPABILITY ENQUIRY message by the MES	45
7.7.4	Invalid MES CAPABILITY ENQUIRY message	45
7.8	RRC Connection mobility procedures	46
7.8.1	Cell Update procedures	46
7.8.1.1	General	47
7.8.1.2	Initiation	47
7.8.1.3	CELL UPDATE message contents to set	50
7.8.1.4	Reception of an CELL UPDATE message by the GERAN	50
7.8.1.5	Reception of the CELL UPDATE CONFIRM message by the MES	51
7.8.1.6	Transmission of a response message to GERAN	53
7.8.1.7	Physical channel failure	56
7.8.1.8	Unsupported configuration by the MES	57
7.8.1.9	Invalid configuration	58
7.8.1.10	Incompatible simultaneous reconfiguration	60
7.8.1.10a	Security reconfiguration during Cell update procedure	61
7.8.1.11	Void	61
7.8.1.12	Invalid CELL UPDATE CONFIRM message	61
7.8.1.13	T302 expiry or cell reselection	62
7.8.1.14	T314 expiry	65
7.8.1.15	T315 expiry	65
7.8.1.16	Reception of the GERAN MOBILITY INFORMATION CONFIRM message by the GERAN	66
7.8.1.17	Inter-RAT cell reselection to GERAN <i>Iu mode</i>	66
7.8.1.17.1	General	66
7.8.1.17.2	Initiation	66
7.8.1.17.3	MES fails to complete an inter-RAT cell reselection	66
7.8.1.18	Inter-RAT cell reselection from GERAN <i>Iu mode</i>	67
7.8.1.18.1	General	67
7.8.1.18.2	Initiation	67
7.8.1.18.3	Successful cell reselection	67
7.8.1.18.4	MES fails to complete an inter-RAT cell reselection	67
7.8.2	GRA update procedure	68
7.8.2.1	General	68
7.8.2.2	Initiation	69
7.8.2.3	GRA UPDATE message contents to set	69
7.8.2.4	Reception of an GRA UPDATE message by the GERAN	70
7.8.2.5	Reception of the GRA UPDATE CONFIRM message by the MES	71
7.8.2.6	Transmission of a response message to GERAN	72
7.8.2.7	Invalid configuration	72
7.8.2.8	Incompatible simultaneous reconfiguration	73
7.8.2.9	Confirmation error of GRA ID list	73
7.8.2.10	Invalid CELL GRA UPDATE CONFIRM message	74
7.8.2.11	T302 expiry or cell reselection	75
7.8.3	GERAN mobility information	77
7.8.3.1	General	77
7.8.3.2	Initiation	77
7.8.3.3	Reception of GERAN MOBILITY INFORMATION message by the MES	78
7.8.3.4	Reception of an GERAN MOBILITY INFORMATION CONFIRM message by the GERAN	81
7.8.3.5	Cell re-selection	81
7.8.3.6	Incompatible simultaneous security reconfiguration	81
7.8.3.7	Invalid GERAN MOBILITY INFORMATION message	82
7.8.4	Inter-mode handover from GERAN <i>Iu mode</i>	82
7.9	Procedures for System Information transmission and Measurement reporting in RRC-Cell_Dedicated state	82
7.9.1	General	82
7.9.2	Measurement Report and Enhanced Measurement Report	82
7.9.2.1	Void	82
7.9.2.2	Parameters for Measurements and Reporting	82
7.9.2.2.1	General	82
7.9.2.2.2	Deriving the 3G Neighbour Cell list from the 3G Neighbour Cell Description	83
7.9.2.2.3	Deriving the GSM Neighbour Cell list from the BSICs and the BCCH Allocation	83
7.9.2.2.4	Deriving the Neighbour Cell list from the GSM Neighbour Cell list and the 3G Neighbour Cell list	83

7.9.2.2.5	Real Time Differences.....	83
7.9.2.2.6	Report Priority Description	83
7.9.2.2.7	The 3G Cell Reselection list.....	83
7.9.2.2.8	CCN Support description.....	83
7.9.3	Extended measurement report.....	83
7.10	Handover to UTRAN procedure	84
7.10.1	General.....	84
7.10.2	Initiation.....	84
7.10.3	Reception of INTER SYSTEM TO UTRAN HANDOVER COMMAND message by the MES.....	84
7.10.4	Successful completion of the inter-RAT handover.....	84
7.10.5	Unsuccessful inter-rat handover at the MES side	85
7.10.6	Reception of an HANDOVER FAILURE message by GERAN in Iu mode.....	86
7.11	Handover to CDMA2000 procedure	86
7.11.1	General.....	86
7.11.2	Initiation.....	86
7.11.3	Reception of INTERSYSTEM TO CDMA2000 HANDOVER COMMAND message by the MES.....	86
7.11.4	Successful completion of the inter-RAT handover.....	87
7.11.5	Unsuccessful inter-rat handover at the MES side	87
7.11.6	Reception of an HANDOVER FAILURE message by GERAN in Iu mode.....	87
7.12	Mapping of user data substreams onto timeslots in a multislot configuration.....	88
7.13	Application Procedures	88
7.13.1	LCS transfer.....	88
7.13.1.1	General.....	88
7.13.1.2	Initiation of LCS transfer procedure in the GERAN	88
7.13.1.3	Reception of LCS DOWNLINK INFORMATION message by the MES	88
7.13.1.4	Transmission of a response message by the MES.....	89
7.13.1.5	Reception of a response message by the GERAN.....	89
7.13.1.6	Invalid LCS DOWNLINK INFORMATION message	89
7.13.2	Position Reporting	90
7.13.2.1	General.....	90
7.13.2.2	Initiation of position reporting procedure in the GERAN.....	90
7.13.2.3	Reception of POSITION REPORT REQUEST message by the MES.....	90
7.13.2.4	Transmission of a response message by the MES.....	90
7.13.2.5	Reception of a response message by the GERAN.....	90
7.13.2.6	Invalid POSITION REPORT REQUEST message.....	90
7.13.3	RAB Upper Layer Reconfiguration	91
7.13.3.1	General.....	91
7.13.3.2	Initiation of RAB Upper Layer Reconfiguration procedure in the GERAN	91
7.13.3.3	Reception of RAB Upper Layer Reconfiguration message by the MES.....	91
7.13.3.4	Transmission of a response message by the MES.....	91
7.13.3.5	Reception of a response message by the GERAN.....	91
7.14	Radio Bearer control procedures	92
7.14.1	Reconfiguration procedures	92
7.14.1.1	General.....	94
7.14.1.2	Initiation.....	94
7.14.1.3	Reception of RADIO BEARER SETUP or RADIO BEARER RECONFIGURATION or RADIO BEARER RELEASE message by the MES	96
7.14.1.4	Transmission of a response message by the MES, normal case.....	103
7.14.1.5	Reception of a response message by the GERAN, normal case.....	105
7.14.1.6	Unsupported configuration in the MES.....	106
7.14.1.7	Physical channel failure	107
7.14.1.8	Cell re-selection	108
7.14.1.9	Transmission of a response message by the MES, failure case.....	108
7.14.1.10	Reception of a response message by the GERAN, failure case	108
7.14.1.11	Invalid configuration.....	109
7.14.1.12	Incompatible simultaneous reconfiguration	109
7.14.1.12.1	Incompatible simultaneous security reconfiguration.....	109
7.14.1.12.2	Cell Update procedure during security reconfiguration.....	110
7.14.1.13	Invalid received message	110
7.14.1.14	Abnormal cases	111
7.14.2	MES initiated DTM procedures while in RRC-Cell_Dedicated-MAC-Dedicated state	112
7.14.2.1	General.....	112

7.14.2.2	Initiation of the DTM Request procedure by the MES	113
7.14.2.3	Reception of a GERAN Iu mode DTM REQUEST message by the GERAN	113
7.14.2.3.1	General	113
7.14.2.3.2	PDCH assignment	113
7.14.2.3.3	DTM Request rejection	114
7.14.2.3.4	Reception of a GERAN Iu mode DTM REJECT message by the MES, normal case.....	114
7.14.2.3.5	Invalid GERAN Iu mode DTM REJECT message.....	114
7.14.2.4	Abnormal cases	114
7.14.2.5	T3148 expiry.....	115
7.15	Signalling flow procedures.....	115
7.15.1	Signalling connection release procedure.....	115
7.15.1.1	General.....	115
7.15.1.2	Initiation of SIGNALLING CONNECTION RELEASE by the GERAN	115
7.15.1.3	Reception of SIGNALLING CONNECTION RELEASE by the MES	116
7.15.1.4	Invalid SIGNALLING CONNECTION RELEASE message.....	116
7.15.1.5	Invalid configuration.....	116
7.15.2	Signalling connection release indication procedure.....	117
7.15.2.1	General.....	117
7.15.2.2	Initiation.....	117
7.15.2.2a	RLC re-establishment, inter-mode handover or inter-RAT change	117
7.15.2.3	Reception of SIGNALLING CONNECTION RELEASE INDICATION by the GERAN	118
7.16	Security mode control	118
7.16.1	Security mode control.....	118
7.16.1.1	General.....	118
7.16.1.2	Initiation.....	118
7.16.1.2.1	Ciphering configuration change	118
7.16.1.2.2	Integrity protection configuration change.....	120
7.16.1.2.3	Reception of SECURITY MODE COMMAND message by the MES.....	122
7.16.1.2.4	Incompatible simultaneous security reconfiguration.....	127
7.16.1.2.5	Cell Update procedure during security reconfiguration.....	128
7.16.1.2.6	Invalid configuration	129
7.16.1.2.7	Reception of SECURITY MODE COMPLETE message by the GERAN.....	129
7.16.1.2.8	Invalid SECURITY MODE COMMAND message	131
7.17	Delivery of Non-Access stratum messages	132
7.17.1	Initial Direct transfer	132
7.17.1.1	General.....	132
7.17.1.2	Initiation of Initial direct transfer procedure in the MES	132
7.17.1.3	RLC re-establishment, inter-mode handover or inter-RAT change	133
7.17.1.4	Abortion of signalling connection establishment	134
7.17.1.5	Reception of INITIAL DIRECT TRANSFER message by the GERAN	134
7.17.2	Downlink Direct transfer	134
7.17.2.1	General.....	134
7.17.2.2	Initiation of downlink direct transfer procedure in the GERAN	134
7.17.2.3	Reception of a DOWNLINK DIRECT TRANSFER message by the MES.....	135
7.17.2.4	No signalling connection exists.....	135
7.17.2.5	Invalid DOWNLINK DIRECT TRANSFER message	135
7.17.3	Uplink Direct transfer	136
7.17.3.1	General.....	136
7.17.3.2	Initiation of uplink direct transfer procedure in the MES	136
7.17.3.3	RLC re-establishment, inter-mode handover or inter-RAT change	137
7.17.3.4	Reception of UPLINK DIRECT TRANSFER message by the GERAN	137
7.18	General procedures.....	137
7.18.1	Selection of initial MES identity.....	137
7.18.2	Actions when entering RRC-Idle mode from RRC-Connected mode	137
7.18.2a	Actions when entering CDMA2000 from GERAN Iu mode, RRC- Connected mode	138
7.18.3	Maintenance of Hyper Frame Numbers.....	139
7.18.4	START value calculation.....	140
7.18.5	Integrity protection	140
7.18.5.0	General.....	140
7.18.5.1	Integrity protection in downlink.....	141
7.18.5.2	Integrity protection in uplink.....	142
7.18.5.3	Calculation of message authentication code	142