Global Handset Requirements for CDMA - WorldMode™

CDG Document 109

Version 1.0

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1. Introduction

1.1 Purpose

The purpose of this document is to define how WorldMode™ (WM) functionality shall be implemented in a CDMA handset.

For CDMA operators, a WorldMode handset is defined as a handset that supports both CDMA and GSM air interfaces. A WorldMode handset may be active on either a CDMA system, a GSM system, or both systems at one time (defined as simultaneous mode). For the purpose of this document, the WorldMode handset defined herein may only be active on one system (CDMA or GSM), at any time (defined as non-simultaneous mode).

This document defines how the air interfaces are managed on a WorldMode handset to determine which system is active, and the user impacts of the underlying air interface.

Included in this document are the recommended system selection requirements for WorldMode as well as the 3GPP specifications which have been used to develop the various features of the GERAN protocol stack.

1.2 Scope

This document is intended to be used by CDMA operators as their WorldMode requirements document.

The target audiences for this document are CDMA operators and handset vendors that are developing handsets that support CDMA, as well as GSM, air interfaces.

This document details the requirements specific to WorldMode functionality. This includes implementation of system selection, manual and automatic, between CDMA and GSM as well as the minimum requirements for GSM/GPRS support. Functional requirements for CDMA and various service enablers (such as WAP or MMS) are detailed in other GHRC requirements documents.

1.3 Conventions

Shading indicates content that has been added or changed in this revision of the document.

1.4 Revision History

Table 1.1 Revision History

Date	Version	Author	Description
17 May 2005	0.1		Preliminary draft
1 June 2006	0.2		Preliminary draft, updated requirements
17 July 2006	0.3		New draft, revised requirements
2 April 2007	0.4	Sean Casey, Sprint	New draft, revised requirements
5 May 2007	0.4.1	Sean Casey, Sprint	Revised draft, added requirements to section 2, system selection
10 May 2007	0.4.2	Sean Casey, Sprint	Revised requirements for SIM card support in section 3
12 May 2007	0.4.3	Sean Casey, Sprint	Accepted requirements for SIM card support in section 3. Updated section 5, GSM requirements. Added section 4, CDMA requirements. Added requirements for “Global Automatic” selection mode in section 2. Added appendix A – example PRI.
17 May 2007	0.4.4	Sean Casey, Sprint	Removed requirements for “Global Automatic” from section 2
21 May 2007	0.4.5	Sean Casey, Sprint	Included requirements for CPHS support
23 August 2007	1.0???		??

1.5 Reference Documents

Reference documents are referred to throughout this specification. Please use the sites listed in Table 1.2 to find reference documents.

Table 1.2 Reference Documents

Reference Documents	Where They Can Be Found
3GPP2	http://www.3gpp2.org/Public_html/specs/index.cfm
CDG	http://www.cdg.org
CCF	http://www.globalccf.org
3GPP	http://www.3gpp.org/specs/specs.htm

1.6 Acronyms and Abbreviations

Table 1.3 Acronyms and Abbreviations

Acronym / Abbreviation	Description
3GPP	Third Generation Partnership Project
3GPP2	Third Generation Partnership Project 2
AMPS	Advanced Mobile Phone System (Analogue Cellular)
ATS	Abstract Test Suite
Available system	A system (SID/NID/band class) that is not listed in the PRL, but the PREF_ONLY field of the PRL is set '0' (unchecked)
BS	Base station
BSR	Better Service Reselection
BSS	Base Station Service
CCCH	Common Control Channel
CDG	CDMA Development Group
CDMA	Code Division Multiple Access
Cdma2000®	TIA/EIA/IS-2000, with a 1.2288 MHz spreading rate
CFB	Call Forwarding Busy
CFNA	Call Forwarding No Answer
CFU	Call Forwarding Unconditional
CHAP	Challenge Handshake Authentication Protocol
CLIP	Calling Line Identification Presentation
CM Service Req	Connection Management Service Request
CR	Change request
CS	Circuit Switched
DAK	Delivery ACK
DL	Data Link
DLL	Dynamic-Link Library
DRX	Discontinuous Reception
DTM	Digital Transfer Mode
DTMF	Dual Tone Multiple Frequency
DTX	Discontinuous Transmission
EFR	Enhanced Full Rate

Acronym / Abbreviation	***Description***
EGPRS	Enhanced General Packet Radio Service
EHDM	Extended Handoff Direction Message
ESCAM	Extended Supplemental Channel Assignment Message
ESN	Electronic Serial Number
EVRC	Enhanced Variable Rate Vocoder
F-SCH	Forward Supplemental Channel
Forbidden system	A negative system or a system that is not listed in the PRL and the PREF_ONLY field of the PRL is set '1' (checked)
FR	Full Rate
FTP	File Transfer Protocol
GEO	A set of system table entries that are listed in a single geographical area in the PRL
GERAN	GSM EDGE RADIO Access Network
GHDM	General Handoff Direction Message
GHRC	Global Handset Requirements for CDMA
GSM	Global System for Mobile communication
GPRS	General Packet Radio Service
HR	Half Rate
HSCSD	High Speed Circuit Switched Data
HTTP	Hypertext Transfer Protocol
HW	Hardware
IM	Instant Messaging
IMSI	International Mobile Subscriber Identity
IOTA	IP-based Over the Air
IPCP	PPP Internet Protocol Control Protocol (see RFC 1332)
IRDA	Infrared Data Association
LBS	Location Based Services
LCP	Link Control Protocol (see RFC 1661)
LLC	Logical Link Control
MAC	Medium Access Control
MCC	Mobile Country Code
MDN	Mobile Directory Number

Acronym / Abbreviation	***Description***
MIN	Mobile Identifier Number
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
Most preferred system	A system (SID/NID/band class) that is listed in the PRL, is not marked as negative, and is listed as the most preferred in its GEO
MRU	Most Recently Used
MS	Mobile Station
MWI	Message Waiting Indication
NACC	Network Assisted Cell Change
NAM	Number Assignment Module
Negative system	A system (SID/NID/band class) that is listed in the PRL and is marked as negative
NID	Network Identification
NV	Nonvolatile
OEM	Original Equipment Manufacturer
OOA	Original Originating Address
OSMS	Over-the-Air Short Message Service
OTA	(Push) Over The Air
OTAPA	Over-the-Air Parameter Administration
OTASP	Over-the-Air Service Provisioning
OTKSL	One Time Key Subsidy Lock
PAP	Password Authentication Protocol
PCF	Packet Control Function
PDSN	Packet Data Serving Node
PI	Presentation Indicator
PLMN	Public Land Mobile Network
PPP	Point-to-Point Protocol
PR	Power Reduction
Preferred system	A system (SID/NID/band class) that is listed in the PRL and is not marked as negative
PRI	Product Release Instruction
PRL	Preferred Roaming List

Acronym / Abbreviation	***Description***
PSMM	Pilot Strength Measurement Message
PST	Programming Service Tool
QCELP	Qualcomm Code Excited Linear Predictive
QoS	Quality of Service
RC	Radio Configuration
RF	Radio Frequency
RLC/MAC	Radio Link Control/Medium Access Control
RLP	Radio Link Protocol
RRC	Radio Resource Control
R-SCH	Reverse Supplemental Channel
R-UIM	Removable Universal Identity Module
SAR	Specific Absorption Rate
SAT	SIM Application Toolkit (STK – SIM Toolkit)
SID	System Identification
SIM	Subscriber Identity Module
SIR	Service Initiation Request
SDMPI	Standard Diagnostic Monitor Programming Interface
SEA	South East Asia
SGSN	Serving GPRS Support Node
SL	Service Loading
SMS	Short Message Service
SNDCP	Subnetwork Dependent Convergence Protocol
SPC	Service Programming Code (see TIA/EIA/IS-683A)
SSD	Shared Secret Data
TCP	Transmission Control Protocol
TLS	Transport Layer Security
UAPROF	User Agent Profile
UDP	User Datagram Protocol
UHDM	Universal Handoff Direction Message
UIM	Universal Identity Module
UMTS	Universal Mobile Telecommunications System

Acronym / Abbreviation	Description
UTK	UIM Tool Kit
VM	Voice Mail
VAD	Voice Activity detection/detector
WAP	Wireless Application Protocol
WM	WorldMode

1.7 Terms and Definitions

Four categories of requirements are established, as shown in Table 1.4:

Table 1.4 Requirement Categories

Category	Notes
(M) Mandatory	The handset must support this characteristic in order to achieve approval.
(HD) Highly Desirable	It is highly desirable and recommended that the handset support this characteristic. This feature may become Mandatory in subsequent versions of the document. Supporting this characteristic will be valued in the commercial promotion of the terminal.
(O) Optional	It is left up to the manufacturer whether or not the terminal supports this characteristic. The handset may support this characteristic. The manufacturer **should not** support this feature or function.
(D) Discard	

1.8 Carrier Acceptance

Table 1.5 details the documentation and equipment that shall be delivered to the CDMA2000® 1x 6 Operator for technical evaluation.

Table 1.5 Carrier Acceptance Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
1.7.1	The WorldMode handset must meet the carrier acceptance requirements specified in CDG Ref #90	M		CDG Ref #90	

Additional requirements specific to carrier acceptance for WorldMode are given as needed in the following sections.

1.8.1 Documentation

Table 1.6 Documentation Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
1.7.2.1	Compliance report detailing GCF completion	M		* Need to determine reference	
1.7.2.2	Compliance report detailing EPCRB completion	M		* Need to determine reference	

2. WorldMode System Selection Requirements

2.1 Purpose

Note: In this document CDMA stands for 1X and 1xEV-DO air interfaces. Similarly GSM stands for GSM, GPRS and WCDMA air interfaces.

This chapter is intended to capture the WorldMode system selection requirements of all operators.

Having all operators using the same WorldMode system selection requirements would help in providing a consistent user experience when roaming into GSM networks. Using this document as-is will also provide operators and handset vendors with the maximum benefit that can be derived from the WorldMode system selection testing.

2.2 Frequency Band/Modes

The frequency band support shall be as described in Table 2.1 for both CDMA and GSM systems. Also refer to 3GPP2 Document C.S0011-B.

Table 2.1 CDMA/GSM Frequency Bands

Technology	*Frequency (MHz)*	*Category*
CDMA IS-2000/IS-95A, Band Class 0	800MHz (A and B bands)	M
CDMA IS-2000/IS-95A, Band Class 0	800MHz Korean Cellular (channel support 1011 - 779)	
CDMA IS-2000/IS-95A, Band Class 1	1900MHz	M
CDMA IS-2000/IS-95A Band Class 5/11	450MHz	
CDMA IS-2000/IS-95A Band Class 6	2100MHz	
AMPS	800MHz (A and B bands)	
GSM 400	450MHz	
GSM 850	850MHz	M
GSM 900 (P-GSM)	900MHz	M
GSM 900 (E-GSM)	900MHz	M
GSM-R (R-GSM)	900MHz	M

Technology	Frequency (MHz)	Category
GSM DCS 1800	1800MHZ	M
GSM PCS 1900	1900MHz	M

Table 2.2 Frequency Band Requirement

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.2.1.1	The device must have an option to enable/disable frequency bands in the PRI.	M	For example, North American CDMA operators may want to disable GSM 850 and 1900 bands.		Y

2.3 Definitions

Note: The term "network" is interchangeable with the term "system" throughout this document.

This section provides a description of the network types, network modes, and system selection modes that are provided on a WorldMode handset. The definitions of these network types, network modes, and system selection modes will be referred to throughout the remainder of the document. Requirements for each of these definitions are defined in Section 2.4 High Level Requirements. **[Author: is this the correct cross-reference?]**

There are two network types a WorldMode handset may use, as shown in Table 2.3.

Table 2.3 Definitions of Network Types

Network Types	Description
CDMA	CDMA stands for 1x and 1xEVDO air interfaces.
GSM	GSM stands for GSM, GPRS, and WCDMA air interfaces.

Additionally, as shown in Table 2.4, there are two network modes a WorldMode handset may use, that can utilize either network type.

Table 2.4 Definitions of Network Modes

Network Modes	Description
Constrained	The handset is constrained to one network type, either CDMA or GSM. This occurs when the home country operator disables either the GSM or CDMA support. All attempts by the user to change network types (through either a software shortcut, or a hardware key), are ignored.

Network Modes	Description
Global	The handset is not constrained to one network type, and can use either GSM or CDMA.

If the network type the WorldMode mobile station (WM MS) is operating on is CDMA, the selection modes are defined as in Table 2.5.

Table 2.5 Definitions of CDMA Selection Modes

CDMA Selection Mode	Description
Automatic	The handset selects the CDMA system based on the PRL, and always selects the most preferred system.
Home Only	The handset only selects home CDMA systems. Roaming systems are ignored.
Roaming Only	The handset only selects roaming CDMA systems. Home systems are ignored.

If the selected network type the WM MS is operating on is GSM, the selection modes are defined as in Table 2.6.

Table 2.6 Definitions of GSM Selection Modes

GSM Selection Mode	Description
Automatic	The handset selects a GSM system based on the PLMN list.
Manual	The user selects the GSM system from a list of the available GSM systems.

When a device is in Global network mode, the device may be active on either the CDMA or GSM network.

There are two selection modes available to the user when both CDMA and GSM are enabled in the PRI: Global Manual and Global Automatic. Table 2.7 defines these modes.

Table 2.7 Definitions of Global Selection Modes

Global Selection Mode	Description
Global Automatic	The device selects the network type independent of user input. Requirements are defined in Section 2.4.1.3
Global Manual	The user selects the network type through either a software shortcut or a dedicated hard key. Requirements are defined in Section 2.4.1.4

Table 2.8 shows the options that are available to the user in the “Main Menu” -> “Settings” -> “Network” settings.

Table 2.8 Network Settings

Global Selection Mode	*Network Type*	*Network Selection Mode*
Global Automatic	CDMA	Automatic
		Home Only
		Roaming Only
	GSM	Automatic
		Manual
Global Manual	CDMA	Automatic
		Home Only
		Roaming Only
	GSM	Automatic
		Manual

There are several different configuration options that will modify the options that are available to the user under the “Main Menu” -> “Settings” -> “Network” menu. For example, the operator may choose to disable GSM support in the PRI. In this case, the user would be shown only the options in Table 2.9.

Table 2.9 Network Settings - GSM Disabled in PRI

	Network Type	*Network Selection Mode*
CDMA		Automatic
		Home Only
		Roaming Only

Additionally, an operator may choose to disable CDMA in the PRI (see Table 2.10).

Table 2.10 Network Settings - CDMA Disabled

	Network Type	*Network Selection Mode*
GSM		Automatic
		Manual

If either CDMA or GSM is disabled by operator in the PRI, the user shall NOT be presented options to change to the global mode. All menu structures available to the user specific to the global mode shall be hidden.

If Global Automatic selection mode is disabled in the PRI, and both CDMA and GSM support are enabled, the user shall be shown just the options in Table 2.11.

Table 2.11 Network Settings - Global Automatic Disabled

Global Selection Mode	*Network Type*	*Network Selection Mode*
Global Manual	CDMA	Automatic
		Home Only
		Roaming Only
	GSM	Automatic
		Manual

If Global Manual selection mode is disabled in the PRI, and both CDMA and GSM support are enabled, the user shall be shown just the options in Table 2.12.

Table 2.12 Network Settings - Global Manual Disabled

Global Selection Mode	*Network Type*	*Network Selection Mode*
Global Automatic	CDMA	Automatic
		Home Only
		Roaming Only
	GSM	Automatic
		Manual

2.4 High Level Requirements

2.4.1 User Experience

A primary objective of a WorldMode handset is to make the user experience of roaming into GSM networks as transparent as possible. In other words, a WorldMode handset would provide a similar user experience (for services that are provided on both CDMA as well as GSM) regardless of whether the handset is roaming into a CDMA or GSM network.

For system selection, this premise implies that the user should not be burdened with the need to perform additional operations, such as manually selecting the handset operating mode, upon switching from a CDMA to a GSM network, or vice versa.

However, a Global Automatic system selection algorithm has not been developed and approved by members of GHRC; as a result, this document provides requirements for Global manual selection of CDMA/GSM system selection, as well as high level functionality of how a Global Automatic system selection algorithm should perform.

2.4.1.1 User Interface Requirements

The option to select the global selection mode, network type, and network selection mode shall be displayed to the user of the WM MS. The options available to the user to select from are configurable through the PRI.

Table 2.13 User Interface Requirements

Req. #	*Requirement*	*Category*	*Remarks*	*References*	*PRI Configurable*
2.4.1.1.1	The WM MS shall display through the user interface a setting titled "Network", found under "Main Menu" -> "Settings" structure.	M			
2.4.1.1.2	Under the "Network" setting, the user shall be able to select one of two settings under the label "Global Selection Mode": "Global Automatic" or "Global Manual", if both are enabled in the PRI.	M			
2.4.1.1.3	If either GSM or CDMA is disabled in the PRI, the device shall NOT show the user the option to select a Global Selection Mode, and all menu structures specific to "Global" mode, must be hidden or masked from the user.	M	For example, if there is a software shortcut to switch network types, this shortcut must be hidden from the user if either GSM or CDMA is disabled.		
2.4.1.1.4	Under the "Network" setting, the user shall be able to select one of two settings under the label "Network Type": "CDMA" or "GSM", if both are enabled in the PRI.	M			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.1.5	Under the network setting, if the selected "Network Type" is "GSM", the user shall be able to select one of two settings under the label "Network Selection Mode": "Automatic" or "Manual".	M			
2.4.1.1.6	Under the network setting, if the selected "Network Type" is "CDMA", the user shall be able to select one of three settings under the label "Network Selection Mode": "Automatic", "Home Only" or "Roaming Only".	M			
2.4.1.1.7	The device display should indicate to the user which network type they are currently using, either GSM or CDMA at the signal bar in the standby status.	M			

2.4.1.2 Global Mode

When both CDMA and GSM are enabled in the PRI, the device is considered to be in Global Mode.

When in Global mode, the user can switch quickly between CDMA and GSM network types. Table 2.14 defines the requirements for the "Global" network mode.

Table 2.14 Global Mode Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.2.1	If neither "Global Automatic" or "Global Manual" is enabled in the PRI, the user shall NOT be shown the "Global Selection Mode" setting.	M			

Req. #	***Requirement***	***Category***	***Remarks***	***References***	***PRI Configurable***
2.4.1.2.2	If no SIM card is present, and the user changes the Network Type from “CDMA” to “GSM”, the device shall display the message “Please insert SIM card to use GSM network”.	M			
2.4.1.2.3	When in Global Mode, WM MS shall support switching network types selection through a hardware key.	HD	The hardware button will switch the user from CDMA to GSM network type, and vice versa.		
2.4.1.2.4	When in Global Mode, WM MS shall support switching network types selection through a software shortcut key.	M	The software shortcut shall NOT be the same as the Main Menu -> Settings -> Network -> network type setting. If a hardware key is supported, this requirement is Highly Desirable.		
2.4.1.2.5	If the user attempts to switch network types through the hardware key, or the software shortcut, the user must be prompted with the following message “Would you like to search for <CDMA/GSM>?.” And given two options: “Yes” or “Cancel”.	M			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.2.6	If CDMA or GSM is disabled in the PRI, attempts to switch network types through the hardware key must be ignored.	M			
2.4.1.2.7	While in an active call, attempts to switch network types through either the hardware key or software shortcut shall be ignored.	M	Attempts to switch network during an active call shall NOT be queued.		
2.4.1.2.8	When in Global Mode, the WM MS shall NOT reset when the user changes the network type from CDMA to GSM.	M			
2.4.1.2.9	If there is no SIM card present, and the device is in Global selection mode, and the user attempts to switch from CDMA to GSM through either a hardware key, or software shortcut, the switch shall NOT be allowed, and the WM MS shall display an error message “Please insert SIM card to use GSM network”.	M			

2.4.1.3 Global Automatic CDMA/GSM System Selection

WM MS shall support a Global Automatic CDMA/GSM selection mode of operation, once one has been developed and approved by GHRC. In this mode, the switch between CDMA and GSM networks is performed automatically, without requiring any input from the user. When multiple networks are available, WM MS shall be able to automatically select the most preferred network, regardless of whether such network is based on CDMA or GSM air interface.

Until a Global Automatic CDMA/GSM system selection mode of operation algorithm has been approved by GHRC, the WM MS shall make implementation of a Global Automatic selection mode optional for the OEM. This selection mode can be enabled/disabled through the PRI. See requirements in Table 2.15.

Table 2.15 Global Automatic CDMA/GSM Selection Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.3.1	The WM MS shall support “Global Automatic” selection mode when both CDMA and GSM are enabled in the PRI.	O			Y
2.4.1.3.2	If the PRI setting for “Global Automatic” is disabled (req. 2.4.1.3.1) , the user shall not be presented the option to select “Global Automatic” as a “Global Selection Mode” in the Network settings.	M			

2.4.1.4 Global Manual CDMA/GSM System Selection

WM MS shall support Global Manual selection mode of operation. This mode can be enabled or disabled by the operator through the PRI.

In Global Manual selection mode the user controls switching between CDMA and GSM network types. The user can switch between CDMA and GSM network types through either a software shortcut, or a hardware key. In constrained mode, the hardware key and software shortcut are disabled, and the user must go into Main Menu -> Settings -> Network setting to change between network types in constrained mode or switch to Global mode, and these options are only available if enabled by the operator through the PRI. This way, an operator has the option to launch a WM MS as a CDMA only device, GSM only device, or Global device, without the user being aware the device can operate in other network modes. See requirements in Table 2.16.

Table 2.16 Global Manual CDMA/GSM Selection Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.4.1	WM MS shall support “Global Manual” selection mode when in “Global” network mode.	M			Y

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.4.2	If the PRI setting for "Global Manual" is disabled (req. 2.4.1.4.1), the user shall not be presented the option to select "Global Manual" as a "Global Selection Mode" in the Network settings.	M			

2.4.1.5 Constrained Mode of Operation

WM MS shall support limiting the air interface capabilities to the CDMA or GSM only mode of operation. In other words, the WM MS should be able to be placed in a mode where it operates as a CDMA only device or GSM only device. In constrained mode, the hardware key and software shortcut are disabled, and the software shortcut should be hidden from the user. See requirements in Table 2.17.

Table 2.17 Constrained Mode Requirements

	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.5.1	The WM MS shall support operating on "CDMA".	M			Y
2.4.1.5.2	If the PRI setting for "CDMA" is disabled (req. 2.4.1.5.1), the user shall not be presented the option to select "CDMA" as a network type in the Network settings.	M			
2.4.1.5.3	The WM MS shall support operating on "GSM".	M			Y
2.4.1.5.4	If the PRI setting for "GSM" is disabled (req. 2.4.1.5.3), the user shall not be presented the option to select "GSM Only" as a network type in the Network settings.	M			

	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.5.5	If there is no SIM card present, and support for “CDMA” is disabled, the WM MS shall display an error message “Please insert SIM card to use GSM”.	M			

2.4.1.6 CDMA Mode

When operating on a CDMA network, WM MS shall fully comply with all CDMA system selection requirements.

CDMA system selection requirements are specified in CDG Document 143.

Table 2.18 defines the requirements for CDMA Only mode.

Table 2.18 CDMA Only Mode Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.6.1	The WM MS must comply with CDG Document 143, Recommended System Selection Requirements for 1x and 1xEV-DO-Capable Terminals.	M		CDG ref. #143	

2.4.1.7 GSM Operation

When operating on a GSM network, WM MS shall fully comply with all GSM system selection requirements.

GSM system selection requirements are specified in the 3GPP recommendations.

Table 2.19 GSM Operation Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.7.1	The WM MS must comply with 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".	M		TS 23.122	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.7.2	The WM MS must comply with 3GPP TS 43.022: "Functions related to Mobile Station (MS) in idle mode and group receive mode."	M		TS 43.022	

2.4.1.8 Power Up Requirements

The WM MS is intended to be a CDMA-centric device and, as a result, shall enable the operator to decide which service to search for first upon power-up. The operator shall be able to select if the device should always search for CDMA systems first upon power-up, or remember the last system selected by the user, and search that system first. See requirements in Table 2.20.

Table 2.20 Power Up Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.8.1	Upon power up, the WM MS shall start in the default “Global Selection Mode”, set by the operator in the PRI setting. The default “Global Selection Mode” must be enabled in the PRI.	M			Y
2.4.1.8.2	If the PRI setting for WM MS “Global Selection Mode” (req. 2.4.1.8.1) is set to NULL, upon power up the WM MS shall start in the same “Global Selection Mode” used at power down.	M			
2.4.1.8.3	Upon power up, the WM MS shall start in the default “network type”, set by the operator in the PRI setting.	M			Y

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.8.4	If the PRI setting for WM MS default "network type" (req. 2.4.1.8.1) is set to NULL, upon power up, the WM MS shall start searching in the same network type used at power down.	M			
2.4.1.8.5	Upon power up, if the WM MS is in Global Mode, and no SIM card is present, the device shall search on CDMA, regardless of the default "network type".	M			
2.4.1.8.6	Upon power up, if there is no SIM card present, and the device is "Constrained" to "GSM", the WM MS shall display an error message "Please insert SIM card to use GSM".	M			

2.4.1.9 Emergency Call Requirements

Emergency calls shall be permitted at all times regardless of "network", "network type", or "selection mode". See requirements in Table 2.21.

Table 2.21 Emergency Call Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.9.1	The WM MS shall allow emergency calls on any available "network", regardless of " "network type", and "selection mode" settings.	M			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
2.4.1.9.2	The WM MS shall allow emergency calls on any available GSM system, even when no SIM card is present on the device.	M			

1

3. Integration of CDMA and GSM Services

3.1 Purpose

The purpose of this section is to define requirements for integrating services between CDMA and GSM.

3.2 High Level Requirements

3.2.1 SIM Card

Table 3.1 defines the requirements for the hardware SIM card slot on the device.

Table 3.1 SIM Card Requirements

Req. #	*Requirement*	*Category*	*Remarks*	*References*	*PRI Configurable*
3.2.1.1	The SIM card slot must support GSM single mode cards.	M		TS 51.011	
3.2.1.2	The SIM card must support R-UIM/GSM SIM dual mode cards.	HD		CDG ref #142	
3.2.1.3	The WM MS shall support handset subsidy locking mechanism to a particular SIM or set of SIMs.	M	If this feature is disabled in the PRI, all SIM cards shall be accepted as valid .	TS 22.022	Y
3.2.1.4	The WM MS shall comply with SIM card physical and electrical characteristics specified in TS 51.011.	M		TS 51.011	
3.2.1.4	The WM ME shall support SIM Application Toolkit.	HD		TS 51.014	

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.1.5	The WM MS shall support Smart Card; Card Application Toolkit Transport Protocol (CAT/TP).	HD		ETSI TS 102.127	
3.2.1.6	The WM MS shall support Smart cards; Card Application Toolkit (CAT).	HD		ETSI TS 102.223	
3.2.1.7	The WM MS shall support secured packet structure for UICC based applications.	M		ETSI TS 102.225	
3.2.1.8	The WM MS shall support Remote APDU structure for UICC based applications.	M		ETSI TS 102.226	

3.2.2 Phonebook Integration

Table 3.2 defines the requirements for phonebook integration.

Table 3.2 Phonebook Integration Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.2.1	When viewing the internal memory phonebook, the WM MS shall provide an option to switch to the phonebook stored on the SIM card.	M			
3.2.2.2	Under any “network type” the SIM card phonebook will be available for viewing, editing and copying.	M			
3.2.2.3	Under any “network type”, the WM MS shall allow the user to make calls from the SIM card phone book.	M			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.2.4	+ code dialing shall be available in both network types. In CDMA mode, the device must comply with + code dialing requirements specified in CDG ref #90. In GSM mode, the device must send a "+" code.	M		CDG ref #90	
3.2.2.5	When viewing the SIM card phonebook, the WM MS shall provide the option to "copy entry", or "copy all" to the internal phonebook.	M			

3.2.3 Call Records

Table 3.3 defines the requirements for call records.

Table 3.3 Call Record Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.3.1	When viewing all call records, the phone must display which network was used for each call.	M			

3.2.4 SMS Integration

Table 3.4 defines the requirements for SMS integration.

Table 3.4 SMS Integration Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.4.1	The WM MS must save all incoming and outgoing SMS messages to the internal memory of the WM MS.	M			

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.4.2	For all SMS messages stored in the internal memory, the device shall display the network the message was received on.	M			
3.2.4.3	The WM MS shall support the option to save GSM SMS messages to the SIM card in addition to the internal memory.	M	If this option is disabled in the PRI, the user cannot choose to save GSM messages to the SIM card.		Y
3.2.4.4	The WM MS shall support the Short Message Service (SMS) Point-to-point (PP).	M	GSM OTA messages shall NOT be affected by req. 3.2.2.3.	TS 23.040 TS 23.048	
3.2.4.5	If there are previously saved SMS messages on the SIM card, the WM MS shall allow the user the option to view those messages.	M			
3.2.4.6	In any “network type”, the WM MS shall allow the user to make calls, and reply to messages from the SIM card SMS message storage.	M			
3.2.4.7	SMS addressing functionality shall include “+” code dialing support on both CDMA and GSM network types. For CDMA requirements are specified in CDG ref. #90. For GSM, a “+” should be sent.	M		CDG ref. #90	

3.2.5 APN Support

The WM MS shall support several different APNs to support different carrier services and features. The APNs should be stored in the PRI, and the operator can enable/disable the user from editing the default APNs. It is also assumed the operator has an agreement with a

GRX/CRX provider to support international data roaming. The requirements in Table 3.5 list the different APNs that the device must support, as well as the formatting of the APN.

Table 3.5 APN Support Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.5.1	All APNs must be formatted as follows: <Network ID>.<MNC>.<MCC> .gprs	M	In CDMA, operators are not given MNC/MCC; the GRX/CRX will provider the CDMA operator values for these fields.		
3.2.5.2	APN for WAP	M	The PRI setting determines if this APN can be modified by the user. This APN will be used for MMS clients and WAP browsing.		Y
3.2.5.3	APN for dial-up networking	M	The PRI setting determines if this APN can be modified by the user.		Y
3.2.5.4	APN for Internet (email, browsing, streaming, etc.)	M	The PRI setting determines if this APN can be modified by the user.		Y
3.2.5.5	APN for Java	M	The PRI setting determines if this APN can be modified by the user.		Y
3.2.5.6	APN for BREW	M	The PRI setting determines if this APN can be modified by the user.		Y

3.2.6 Service/Feature Integration

The services and features in Table 3.6 should work seamlessly across either a 1X or GSM network. If a feature is highly desirable, the device tier will determine whether or not it is included on the device. For each feature, please refer to appropriate CDG documents for feature-specific requirements.

Table 3.6 Service/Feature Integration Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.6.1	All services/features that are enabled in CDMA “network type” must also be enabled and work in a similar fashion on GSM “network type”.	M			
3.2.6.2	The WM MS shall include an SMS client.	M			
3.2.6.3	The WM MS shall include an MMS client.	HD		CDG ref. #92	
3.2.6.4	The WM MS shall support WAP.	M			
3.2.6.5	The WM MS shall support dial-up networking.	M			

3.2.7 Clock

Table 3.7 defines the clock requirements.

Table 3.7 Clock Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
3.2.7.1	When a CDMA system is selected the clock shall be synchronized with the CDMA system time.	M		CDG ref #90	
3.2.7.2	The handset shall maintain an internal clock that is not dependant on CDMA system time (i.e., clock works even when system, either GSM or CDMA, is unavailable).	M			
3.2.7.3	When a GSM system is selected, the user shall be able to set the time and time zone.	M			

4. CDMA2000 Specifications for WorldMode Products

4.1 Purpose

The purpose of this section is to define the requirements for CDMA2000 based systems.

All specifications for CDMA2000 based systems can be found in CDG Document 90 – GHRC 6 CDMA200 Voice, SMS, and Data.

Table 4.1 CDMA2000 Specifications for WorldMode

Req. #	*Requirement*	*Category*	*Remarks*	*References*	*PRI Configurable*
4.1.1.1	The WM MS shall be compliant with CDG Document #90.	M		CDG ref. #90	

5. GERAN 3GPP Specifications for WorldMode Products

5.1 Purpose

The purpose of this chapter is to define the requirements for the GERAN-based systems.

Table 5.1 specifies the baseline release of the 3GPP Technical Specifications and Technical Reports for a GERAN-based 3GPP system with which the WorldMode MS must be compliant.

Table 5.1 3GPP Specifications for GERAN-Based Systems

Feature	*3GPP Spec*	*Specs Defined*
GSM/GPRS	3GPP R4, Mar 2007	6.18.2

Table 5.2 GERAN Requirements

Req. #	*Requirement*	*Category*	*Remarks*	*References*	*PRI Configurable*
5.1.1.1	The WM MS shall be compliant with 3GPP specifications defined in 3GPP R4, Mar 2007.	M		3GPP R4, Mar 2007	

5.2 Specifications

The WM MS must be compliant with the GSM/GPRS specifications specified in Release 4, March 2007, of the 3GPP standards. See Table 5.3.

Table 5.3 Specifications and Reports

Number	*Title*
21.801	Specification drafting rules
21.900	Technical Specification Group working methods
21.905	Vocabulary for 3GPP Specifications

Number	Title
22.001	Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)
22.002	Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)
22.003	Circuit Teleservices supported by a Public Land Mobile Network (PLMN)
22.004	General on supplementary services
22.011	Service accessibility
22.016	International Mobile Equipment Identities (IMEI)
22.022	Personalisation of Mobile Equipment (ME); Mobile functionality specification
22.024	Description of Charge Advice Information (CAI)
22.030	Man-Machine Interface (MMI) of the User Equipment (UE)
22.031	Fraud Information Gathering System (FIGS); Service description; Stage 1
22.032	Immediate Service Termination (IST); Service description; Stage 1
22.034	High Speed Circuit Switched Data (HSCSD); Stage 1
22.038	USIM Application Toolkit (USAT/SAT); Service description; Stage 1
22.041	Operator Determined Call Barring
22.042	Network Identity and Time Zone (NITZ) service description; Stage 1
22.048	Security mechanisms for the (U)SIM application toolkit; Stage 1
22.053	Tandem Free Operation (TFO); Service description; Stage 1
22.057	Mobile Execution Environment (MExE) service description; Stage 1
22.060	General Packet Radio Service (GPRS); Service description; Stage 1
22.066	Support of Mobile Number Portability (MNP); Stage 1
22.067	enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1
22.071	Location Services (LCS); Service description; Stage 1
22.072	Call Deflection (CD); Stage 1
22.076	Noise suppression for the AMR codec; Service description; Stage 1
22.078	Customized Applications for Mobile network Enhanced Logic (CAMEL); Service description; Stage 1
22.079	Support of optimal routing; Stage 1
22.081	Line Identification supplementary services; Stage 1
22.082	Call Forwarding (CF) Supplementary Services; Stage 1
22.083	Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 1
22.084	MultiParty (MPTY) supplementary service; Stage 1
22.085	Closed User Group (CUG) supplementary services; Stage 1

Number	Title
22.086	Advice of Charge (AoC) supplementary services; Stage 1
22.087	User-to-user signalling (UUS); Stage 1
22.088	Call Barring (CB) supplementary services; Stage 1
22.090	Unstructured Supplementary Service Data (USSD); Stage 1
22.091	Explicit Call Transfer (ECT) supplementary service; Stage 1
22.093	Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1
22.094	Follow Me service description - Stage 1
22.096	Name identification supplementary services; Stage 1
22.097	Multiple Subscriber Profile (MSP) Phase 2; Service description; Stage 1
22.115	Service aspects; Charging and billing
22.121	Service aspects; The Virtual Home Environment (VHE); Stage 1
22.129	Handover requirements between UTRAN and GERAN or other radio systems
22.140	Multimedia Messaging Service (MMS); Stage 1
23.002	Network architecture
23.003	Numbering, addressing and identification
23.007	Restoration procedures
23.008	Organization of subscriber data
23.009	Handover procedures
23.011	Technical realization of Supplementary Services
23.012	Location management procedures
23.014	Support of Dual Tone Multi Frequency (DTMF) signalling
23.015	Technical realization of Operator Determined Barring (ODB)
23.016	Subscriber data management; Stage 2
23.018	Basic Call Handling; Technical realization
23.031	Fraud Information Gathering System (FIGS); Service description; Stage 2
23.032	Universal Geographical Area Description (GAD)
23.034	High Speed Circuit Switched Data (HSCSD); Stage 2
23.035	Immediate Service Termination (IST); Stage 2
23.038	Alphabets and language-specific information
23.039	Interface Protocols for the Connection of Short Message Service Centers (SMSCs) to Short Message Entities (SMEs)
23.040	Technical realization of Short Message Service (SMS)

Number	Title
23.041	Technical realization of Cell Broadcast Service (CBS)
23.042	Compression algorithm for SMS
23.048	Security mechanisms for the (U)SIM application toolkit; Stage 2
23.053	Tandem Free Operation (TFO); Service description; Stage 2
23.057	Mobile Execution Environment (MExE); Functional description; Stage 2
23.060	General Packet Radio Service (GPRS); Service description; Stage 2
23.066	Support of GSM Mobile Number Portability (MNP) stage 2
23.067	Enhanced Multi-Level Precedence and Pre-emption Service (eMLPP); Stage 2
23.072	Call Deflection Supplementary Service; Stage 2
23.078	Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase X; Stage 2
23.079	Support of Optimal Routeing (SOR); Technical realization; Stage 2
23.081	Line Identification supplementary services; Stage 2
23.082	Call Forwarding (CF) Supplementary Services; Stage 2
23.083	Call Waiting (CW) and Call Hold (HOLD) Supplementary Service; Stage 2
23.084	MultiParty (MPTY) Supplementary Service; Stage 2
23.085	Closed User Group (CUG) Supplementary Service; Stage 2
23.086	Advice of Charge (AoC) Supplementary Service; Stage 2
23.087	User-to-User Signalling (UUS) supplementary service; Stage 2
23.088	Call Barring (CB) Supplementary Service; Stage 2
23.090	Unstructured Supplementary Service Data (USSD); Stage 2
23.091	Explicit Call Transfer (ECT) Supplementary Service; Stage 2
23.093	Technical realization of Completion of Calls to Busy Subscriber (CCBS); Stage 2
23.094	Follow Me Stage 2
23.096	Name identification supplementary service; Stage 2
23.097	Multiple Subscriber Profile (MSP) Phase 1; Stage 2
23.107	Quality of Service (QoS) concept and architecture
23.108	Mobile radio interface layer 3 specification core network protocols; Stage 2 (structured procedures)
23.110	UMTS Access Stratum Services and Functions
23.116	Super-Charger technical realization; Stage 2
23.119	Gateway Location Register (GLR); Stage 2
23.122	Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode

Number	*Title*
23.140	Multimedia Messaging Service (MMS); Functional description; Stage 2
23.221	Architectural requirements
23.271	Functional stage 2 description of Location Services (LCS)
23.908	Technical report on Pre-Paging
23.909	Technical report on the Gateway Location Register
23.911	Technical report on Out-of-band transcoder control
23.912	Technical report on Super-Charger
24.002	GSM-UMTS Public Land Mobile Network (PLMN) Access Reference Configuration
24.007	Mobile radio interface signalling layer 3; General Aspects
24.008	Mobile radio interface Layer 3 specification; Core network protocols; Stage 3
24.010	Mobile Radio Interface Layer 3 - Supplementary Services Specification - General Aspects
24.011	Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface
24.022	Radio Link Protocol (RLP) for circuit switched bearer and teleservices
24.030	Location Services (LCS); Supplementary service operations; Stage 3
24.067	Enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 3
24.072	Call Deflection Supplementary Service; Stage 3
24.080	Mobile radio Layer 3 supplementary service specification; Formats and coding
24.081	Line Identification Supplementary Service; Stage 3
24.082	Call Forwarding supplementary service; Stage 3
24.083	Call Waiting (CW) and Call Hold (HOLD) Supplementary Service; Stage 3
24.084	MultiParty (MPTY) Supplementary Service; Stage 3
24.085	Closed User Group (CUG) Supplementary Service; Stage 3
24.086	Advice of Charge (AoC) Supplementary Service; Stage 3
24.087	User-to-User Signalling (UUS); Stage 3
24.088	Call Barring (CB) Supplementary Service; Stage 3
24.090	Unstructured Supplementary Service Data (USSD); Stage 3
24.091	Explicit Call Transfer (ECT) Supplementary Service; Stage 3
24.093	Call Completion to Busy Subscriber (CCBS); Stage 3
24.096	Name Identification Supplementary Service; Stage 3
26.071	AMR speech Codec; General description
26.073	AMR speech Codec; C-source code
26.074	AMR speech Codec; Test sequences

Number	Title
26.077	Minimum performance requirements for noise suppresser application to the Adaptive Multi-Rate (AMR) speech encoder
26.090	AMR speech Codec; Transcoding Functions
26.091	AMR speech Codec; Error concealment of lost frames
26.092	AMR speech Codec; comfort noise for AMR Speech Traffic Channels
26.093	AMR speech Codec; Source Controlled Rate operation
26.094	AMR Speech Codec; Voice Activity Detector for AMR Speech Traffic Channels
26.101	Mandatory speech codec speech processing functions; Adaptive Multi-Rate (AMR) speech codec frame structure
26.102	Adaptive Multi-Rate (AMR) speech codec; Interface to Iu and Uu
26.103	Speech codec list for GSM and UMTS
26.104	ANSI-C code for the floating-point Adaptive Multi-Rate (AMR) speech codec
26.110	Codec for circuit switched multimedia telephony service; General description
26.111	Codec for Circuit switched Multimedia Telephony Service; Modifications to H.324
26.901	Adaptive Multi-Rate Wideband (AMR-WB) speech codec; Feasibility study report
26.911	Codec(s) for Circuit-Switched (CS) multimedia telephony service; Terminal implementor's guide
26.975	Performance characterization of the Adaptive Multi-Rate (AMR) speech codec
26.978	Results of the Adaptive Multi-Rate (AMR) noise suppression selection phase
27.001	General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)
27.002	Terminal Adaptation Functions (TAF) for services using Asynchronous bearer capabilities
27.003	Terminal Adaptation Functions (TAF) for services using Synchronous bearer capabilities
27.005	Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE-DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)
27.007	AT command set for User Equipment (UE)
27.010	Terminal Equipment to User Equipment (TE-UE) multiplexer protocol
27.060	Packet domain; Mobile Station (MS) supporting Packet Switched services
27.103	Wide Area Network Synchronization
28.062	Inband Tandem Free Operation (TFO) of speech codecs; Service description; Stage 3
29.002	Mobile Application Part (MAP) specification
29.007	General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)

Number	Title
29.010	Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC); Signalling Procedures and the Mobile Application Part (MAP)
29.011	Signalling Interworking for Supplementary Services
29.013	Signalling interworking between ISDN supplementary services Application Service Element (ASE) and Mobile Application Part (MAP) protocols
29.016	Serving GPRS Support Node SGSN - Visitors Location Register (VLR); Gs Interface Network Service Specification
29.018	General Packet Radio Service (GPRS); Serving GPRS Support Node (SGSN) - Visitors Location Register (VLR); Gs interface layer 3 specification
29.060	General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface
29.061	Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)
29.078	Customized Applications for Mobile network Enhanced Logic (CAMEL) Phase X; CAMEL Application Part (CAP) specification
29.994	Recommended infrastructure measures to overcome specific Mobile Station (MS) and User Equipment (UE) faults
30.902	Guidelines for the modification of the Mobile Application Part (MAP) in Phase 2+
31.048	Security mechanisms for the (U)SIM application toolkit; Test specification
31.111	Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)
32.1111	Telecommunication management; Fault Management; Part 1: 3G fault management requirements
32.1112	Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)
32.1113	Telecommunication management; Fault Management; Part 3: Alarm Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.1114	Telecommunication management; Fault Management; Part 4: Alarm Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
32.200	Telecommunication management; Charging management; Charging principles
32.300	Telecommunication management; Configuration Management (CM); Name convention for Managed Objects
32.301	Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Requirements
32.302	Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)

Number	Title
32.303	Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.304	Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
32.311	Telecommunication management; Generic Integration Reference Point (IRP) management; Requirements
32.312	Telecommunication management; Generic Integration Reference Point (IRP) management; Information Service (IS)
32.401	Telecommunication management; Performance Management (PM); Concept and requirements
32.403	Telecommunication management; Performance Management (PM); Performance measurements ¬UMTS and combined UMTS/GSM
32.600	Telecommunication management; Configuration Management (CM); Concept and high-level requirements
32.601	Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); Requirements
32.602	Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP): Information Service (IS)
32.603	Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.604	Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP) Common Management Information Protocol (CMIP) Solution Set (SS)
32.611	Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Requirements
32.612	Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Information Service (IS)
32.613	Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.614	Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
32.615	Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): eXtensible Markup Language (XML) file format definition
32.621	Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP); Requirements
32.622	Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)

Number	Title
32.623	Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.624	Telecommunication management; Configuration Management (CM); Generic network resources: Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
32.632	Telecommunication management; Configuration Management (CM); Core Network Resources Integration Reference Point (IRP): Network Resource Model (NRM)
32.633	Telecommunication management; Configuration Management (CM); Core network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.634	Telecommunication management; Configuration Management (CM); Core network resources Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
32.651	Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Requirements
32.652	Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)
32.653	Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
32.654	Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)
41.031	Fraud Information Gathering System (FIGS); Service requirements; Stage 0
41.033	Lawful Interception requirements for GSM
41.061	General Packet Radio Service (GPRS); GPRS ciphering algorithm requirements
41.101	Technical Specifications and Technical Reports for a GERAN-based 3GPP system
42.009	Security aspects
42.017	Subscriber Identity Module (SIM); Functional characteristics
42.019	Subscriber Identity Module Application Programming Interface (SIM API); Stage 1
42.033	Lawful Interception; Stage 1
42.043	Support of Localised Service Area (SoLSA); Service description; Stage 1
42.056	GSM Cordless Telephony System (CTS), Phase 1; Service description; Stage 1
42.068	Voice Group Call Service (VGCS); Stage 1
42.069	Voice Broadcast Service (VBS); Stage 1
43.005	Technical performance objectives
43.010	GSM Public Land Mobile Network (PLMN) connection types

Number	Title
43.013	Discontinuous Reception (DRX) in the GSM system
43.019	Subscriber Identity Module Application Programming Interface (SIM API) for Java Card; Stage 2
43.020	Security-related network functions
43.022	Functions related to Mobile Station (MS) in idle mode and group receive mode
43.026	Multiband operation of GSM / DCS 1800 by a single operator
43.030	Radio network planning aspects
43.033	3G security; Lawful Interception; Stage 2
43.045	Technical Realization of Facsimile Group 3 Service - transparent
43.050	Transmission planning aspects of the speech service in the GSM Public Land Mobile Network (PLMN) system
43.052	Lower layers of the GSM Cordless Telephony System (CTS) radio interface; Stage 2
43.055	Dual Transfer Mode (DTM); Stage 2
43.058	Characterisation, test methods and quality assessment for handsfree Mobile Stations (MSs)
43.059	Functional stage 2 description of Location Services (LCS) in GERAN
43.064	General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2
43.068	Voice Group Call Service (VGCS); Stage 2
43.069	Voice Broadcast service (VBS); Stage 2
43.073	Support of Localised Service Area (SoLSA); Stage 2
44.001	Mobile Station - Base Station System (MS - BSS) Interface General Aspects and Principles
44.003	Mobile Station - Base Station System (MS - BSS) Interface Channel Structures and Access Capabilities
44.004	Layer 1; General Requirements
44.005	Data Link (DL) Layer General Aspects
44.006	Mobile Station - Base Stations System (MS - BSS) interface Data Link (DL) layer specification
44.012	Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface
44.013	Performance Requirements on Mobile Radio Interface
44.014	Individual equipment type requirements and interworking; Special conformance testing functions
44.018	Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol
44.021	Rate Adaption on the Mobile Station - Base Station System (MS-BSS) Interface

Number	Title
44.031	Location Services (LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC) Radio Resource LCS Protocol (RRLP)
44.035	Location Services (LCS); Broadcast network assistance for Enhanced Observed Time Difference (E-OTD) and Global Positioning System (GPS) positioning methods
44.056	GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification
44.057	GSM Cordless Telephony System (CTS), (Phase 1) CTS CTS supervising system Layer 3 Specification
44.060	General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control / Medium Access Control (RLC/MAC) protocol
44.064	Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification
44.065	Mobile Station (MS) -Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)
44.068	Group Call Control (GCC) Protocol
44.069	Broadcast Call Control (BCC) protocol
44.071	Location Services (LCS); Mobile radio interface layer 3 LCS specification
45.001	Physical layer on the radio path; General description
45.002	Multiplexing and multiple access on the radio path
45.003	Channel coding
45.004	Modulation
45.005	Radio transmission and reception
45.008	Radio subsystem link control
45.009	Link adaptation
45.010	Radio subsystem synchronization
45.015	Release independent Downlink Advanced Receiver Performance (DARP); Implementation guidelines
45.022	Radio link management in hierarchical networks
45.050	Background for RF Requirements
45.056	CTS-FP Radio Sub-system
46.001	Full rate speech; Processing functions
46.002	Half rate speech; Half rate speech processing functions
46.006	Half-rate speech: ANSI-C code for GSM half-rate speech codec
46.007	Half rate speech; Test sequences for the GSM half rate speech codec
46.008	Half Rate Speech; Performance Characterization of the GSM Half Rate speech codec

Number	Title
46.010	Full-rate speech; Transcoding
46.011	Full rate speech; Substitution and muting of lost frames for full rate speech channels
46.012	Full rate speech; Comfort noise aspect for full rate speech traffic channels
46.020	Half rate speech; Half rate speech transcoding
46.021	Half rate speech; Substitution and muting of lost frames for half rate speech traffic channels
46.022	Half rate speech; Comfort noise aspects for the half rate speech traffic channels
46.031	Full rate speech; Discontinuous Transmission (DTX) for full rate speech traffic channels
46.032	Full rate speech; Voice Activity Detector (VAD) for full rate speech traffic channels
46.041	Half rate speech; Discontinuous Transmission (DTX) for half rate speech traffic channels
46.042	Half rate speech; Voice Activity Detector (VAD) for half rate speech traffic channels
46.051	Enhanced Full Rate (EFR) speech processing functions; General description
46.053	ANSI-C code for the GSM Enhanced Full Rate (EFR) speech codec
46.054	Test sequences for the GSM Enhanced Full Rate (EFR) speech codec
46.055	Performance characterization of the GSM Enhanced Full Rate (EFR) speech codec
46.060	Enhanced Full Rate (EFR) speech transcoding
46.061	Substitution and muting of lost frames for Enhanced Full Rate (EFR) speech traffic channels
46.062	Comfort noise aspects for Enhanced Full Rate (EFR) speech traffic channels
46.076	Adaptive Multi-Rate (AMR) speech codec; Study phase report
46.081	Discontinuous Transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels
46.082	Voice Activity Detector (VAD) for Enhanced Full Rate (EFR) speech traffic channels
46.085	Subjective tests on the interoperability of the Half Rate / Full Rate / Enhanced Full Rate (HR/FR/EFR) speech codecs, single, tandem and tandem free operation
48.001	Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; General aspects
48.002	Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Interface principles
48.004	Base Station System - Mobile-services Switching Centre (BSS - MSC) interface; Layer 1 specification
48.006	Signalling Transport Mechanism Specification for the Base Station System - Mobile Services Switching Centre (BSS-MSC) Interface
48.008	Mobile Switching Centre - Base Station system (MSC-BSS) interface; Layer 3 specification

Number	Title
48.014	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1
48.016	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Network service
48.018	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS protocol (BSSGP)
48.020	Rate Adaptation on the Base Station System - Mobile Service Switching Centre (BSS-MSC) Interface
48.031	Location Services LCS: Serving Mobile Location Centre - Serving Mobile Location Centre (SMLC ¬SMLC); SMLCPP specification
48.051	Base Station Controller - Base Transceiver Station (BSC-BTS) interface; General aspects
48.052	Base Station Controller - Base Transceiver Station (BSC-BTS) interface; Interface principles
48.054	Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 1 structure of physical circuits
48.056	Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 2 specification
48.058	Base Station Controller - Base Transceiver Station (BCS-BTS) Interface Layer 3 Specification
48.060	In-band control of remote transcoders and rate adaptors for full rate traffic channels
48.061	In-band control of remote transcoders and rate adaptors for half rate traffic channels
48.071	Location Services (LCS); Serving Mobile Location Centre - Base Station System (SMLC-BSS) interface; Layer 3 specification
49.001	General network interworking scenarios
49.008	Application of the Base Station System Application Part (BSSAP) on the E-Interface
49.031	Location Services (LCS); Base Station System Application Part LCS Extension (BSSAP-LE)
49.995	General Packet Radio Service (GPRS); Interworking between modified Public Land Mobile Network (PLMN) supporting GPRS and legacy GPRS mobiles
50.059	Enhanced Data rates for GSM Evolution (EDGE); Project scheduling and open issues for EDGE
51.0101	Mobile Station (MS) conformance specification; Part 1: Conformance specification
51.0102	Mobile Station (MS) conformance specification; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification
51.0103	Mobile Station (MS) conformance specification; Part 3: Layer3 (L3) Abstract Test Suite (ATS)
51.0104	Mobile Station (MS) conformance specification; Part 4: SIM Application Toolkit conformance specification

Number	Title
51.011	Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface
51.013	Test specification for Subscriber Identity Module (SIM) Application Programming Interface (API) for Java Card
51.014	Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface
51.017	Subscriber Identity Module (SIM) test specification
51.021	Base Station System (BSS) equipment specification; Radio aspects
51.026	Base Station System (BSS) equipment specification; Part 4: Repeaters
52.021	Network Management (NM) Procedures and messages on the A-bis interface
52.402	Telecommunication management; Performance Management (PM); Performance measurements ¬GSM
55.216	Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 1: A5/3 and GEA3 specification
55.217	Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 2: Implementors' test data
55.218	Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 3: Design and conformance test data
55.919	Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 4: Design and evaluation report

5.2.1 Other GSM Requirements

Table 5.4 Other GSM Requirements

Req. #	Requirement	Category	Remarks	References	PRI Configurable
5.2.1.1	The WM MS shall be compliant with the Common PCN Handset Specification.	HD		CPHS4_3.WW6	

6. Appendix – Example PRI Document for WorldMode

Table 6.1 contains an example of the PRI settings specific to the WorldMode mobile station.

Table 6.1 Example PRI Document

Feature	***Customer Setting***	***Default Setting / Possible Values***	***Remarks***
Global Automatic		<True/False>	If false, “global automatic” selection mode is disabled
Global Manual		<True/False>	If false, “global manual” selection mode is disabled
CDMA		<True/False>	If false, “CDMA” network type is disabled
GSM		<True/False>	If false, “GSM” network type is disabled
Default Global Selection Mode		<Global Manual/Global Automatic/NULL>	This is the network mode the device defaults to upon power up. If NULL, device defaults to last network mode at power down
Default Network Type		<CDMA/GSM/NULL>	This is the network type the device defaults to upon power up. If NULL, device defaults to last network type at power down
Subsidy Locking		<True/False>	If this feature is disabled (false setting), all SIM cards shall be accepted as valid

Feature	***Customer Setting***	***Default Setting / Possible Values***	***Remarks***
User ability to save SMS messages to SIM		<True/False>	If this option is disabled (false setting), the user cannot choose to save GSM messages to the SIM card
APN for WAP			
APN User Editable		<True/False>	If false, user may not edit this APN
APN for dial-up networking			
APN User Editable		<True/False>	If false, user may not edit this APN
APN for Internet (email, browsing, etc.)			
APN User Editable		<True/False>	If false, user may not edit this APN
APN for Java			
APN User Editable		<True/False>	If false, user may not edit this APN
APN for BREW			
APN User Editable		<True/False>	If false, user may not edit this APN

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