Oracle® Communications
Network Charging and Control
External Machine Interface (EMI) Protocol
Implementation Conformance Statement
Release 5.0.1

June 2013
Copyright

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.
# Contents

- About This Document ........................................................................................................... v
- Document Conventions .......................................................................................................... vi

## Chapter 1

**Messaging Manager and CMG Document Versions** .......................................................... 7

- Overview ................................................................................................................................. 7
- Messaging Manager ................................................................................................................. 7
- CMG ...................................................................................................................................... 8

## Chapter 2

**Compliance Statement** ...................................................................................................... 9

- Overview ................................................................................................................................. 9
- CMG References ................................................................................................................... 9
- Specification Sections 2 and 3 .............................................................................................. 9
- Specification Section 4 ............................................................................................................ 10
- Specification Section 5 .......................................................................................................... 15
- Specification Section 6 .......................................................................................................... 24
- Specification Section 7 .......................................................................................................... 26

**NCC Glossary of Terms** ..................................................................................................... 27

**Index** .................................................................................................................................. 31
About This Document

Scope

This document describes the extent to which Messaging Manager (MM) conforms with the EMI - UCP Interface Specification.

Audience

This document is intended to be read by Oracle staff. It has been prepared on the assumption that the reader is familiar with Messaging Manager as well as the short message capabilities of the GSM specification.
Document Conventions

Typographical Conventions
The following terms and typographical conventions are used in the Oracle Communications Network Charging and Control (NCC) documentation.

<table>
<thead>
<tr>
<th>Formatting convention</th>
<th>Type of information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Special Bold</strong></td>
<td>Items you must select, such as names of tabs. Names of database tables and fields.</td>
</tr>
<tr>
<td><strong>Italics</strong></td>
<td>Name of a document, chapter, topic or other publication. Emphasis within text.</td>
</tr>
<tr>
<td><strong>Button</strong></td>
<td>The name of a button to click or a key to press. <strong>Example:</strong> To close the window, either click <strong>Close</strong>, or press <strong>Esc</strong>.</td>
</tr>
<tr>
<td><strong>Key+Key</strong></td>
<td>Key combinations for which the user must press and hold down one key and then press another. <strong>Example:</strong> <strong>Ctrl+P</strong>, or <strong>Alt+F4</strong>.</td>
</tr>
<tr>
<td><strong>Monospace</strong></td>
<td>Examples of code or standard output.</td>
</tr>
<tr>
<td><strong>Monospace Bold</strong></td>
<td>Text that you must enter.</td>
</tr>
<tr>
<td><strong>variable</strong></td>
<td>Used to indicate variables or text that should be replaced.</td>
</tr>
</tbody>
</table>
| **menu option > menu option** | Used to indicate the cascading menu option to be selected, or the location path of a file. **Example:** **Operator Functions > Report Functions**  
**Example:** /IN/html/SMS/Helptext/ |
| **hypertext link**    | Used to indicate a hypertext link on an HTML page. |

Specialized terms and acronyms are defined in the *Glossary* at the end of this guide.
Chapter 1

Messing Manager and CMG Document Versions

Overview

Introduction

This chapter defines the version of Messaging Manager and the CMG document against which it is compared.

In this chapter

This chapter contains the following topics.

Messing Manager 7
CMG 8

Messing Manager

Messing Manager implementation

This document states compliance for Messaging Manager version 3.1.1. The environment for this version of Messaging Manager is defined below.

- Target platform
  - Platform - SPARC Solaris
  - Operating system - SunOS 5.9
  - Database - Oracle 9.2.05
- Build environment
  - Compiler - GNU GCC 3.2.3
  - Binutils - GNU binutils 2.14
  - bison - 1.35
  - flex - 2.5.4
- Oracle packages
  - Full installation of:
    - SLEE - 3.2.0
    - HssScIF - 3.4.27
      - Plus the following SCP packages:
        - smsScp - 3.0.0
        - acsScp - 2.4.0
        - beApiScp - 2.2.0.5
        - acsCbScp 2.2.0.6
      - Plus the following SMP packages:
        - smsSms - 3.0.0
        - acsSms - 2.4.0
        - beApiSms - 2.2.0.5
CMG

CMG document

This statement of compliance refers to the CMG Wireless Data Solutions document entitled:

*Short Message Service Centre 4.5 EMI - UCP Interface Specification Version 4.22.*

For the purpose of this document, *Short Message Service Centre 4.5 EMI - UCP Interface Specification Version 4.22* will be referred to as *The Specification.*
Chapter 2

Compliance Statement

Overview

Introduction

This chapter identifies which EMI services are supported by Messaging Manager.

In this chapter

This chapter contains the following topics.

CMG References

Specification Sections 2 and 3 9
Specification Section 4 10
Specification Section 5 15
Specification Section 6 24
Specification Section 7 26

CMG References

Convention

As a cross reference, the clause number of The Specification is included in brackets at the end of each compliance statement title.

Specification Sections 2 and 3

Introduction

Statements of compliance with sections 2 and 3 of The Specification follow.

Structure of EMI Messages (2)

Messaging Manager complies.

Messaging Manager stores message text internally as UCS-2 (Unicode) or the GSM default alphabet. The Euro symbol (€) is converted to an 'E' if the message is altered.

stx and etx

Messaging Manager complies.

header

Messaging Manager complies.
data
See compliance statements for individual operation types.

checksum
Messaging Manager complies.

EMI Commands (3)
Statements of compliance for EMI commands are covered under the following three headings.

- SMT initiated commands
- SMSC initiated commands
- Flow control

SMT initiated commands (3.1)
Messaging Manager complies.

SMSC initiated commands (3.2)
Messaging Manager complies.

Flow control (3.3)
Messaging Manager complies.

Messaging Manager supports windowing with a configurable 'windowsize' parameter that defaults to 100. Messages outside the window are correctly ignored.

Specification Section 4

Introduction
Statements of compliance for clauses of Section 4 of The Specification follow.

Address syntax (4.1)
Messaging Manager complies.

Messaging Manager has configurable numberRules to allow correct conversion and normalisation of addresses.

Call input operation -01 (4.2)
Messaging Manager complies.

- Messaging Manager does not construct a call input operation unless it is creating an altered copy of one already passed in.
- Messaging Manager can accept -01 messages from both the SMT and SMSC.
- EMI messages are converted to and from GenericSM.
- The GenericSM message type is set to Submit if the message comes from an SMT, or Deliver if the message comes from an SMSC.
Individual message parameters and their internal storage locations are set out in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSM location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdC</td>
<td>destinationAddress</td>
<td>TON and NPI come from numberRules.</td>
</tr>
<tr>
<td>OAdC</td>
<td>sourceAddress</td>
<td>TON and NPI come from numberRules. <strong>Note:</strong> Although the OAdC parameter is optional in the EMI specification, it is mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages unless the OAdC parameter is present.</td>
</tr>
<tr>
<td>AC</td>
<td></td>
<td>• Ignored by Messaging Manager. • Set to &quot;&quot; on generated outgoing messages.</td>
</tr>
<tr>
<td>MT</td>
<td></td>
<td>Not stored in GenericSM.</td>
</tr>
<tr>
<td>NMsg</td>
<td>userData</td>
<td>Converted to GSM format.</td>
</tr>
<tr>
<td>AMsg</td>
<td>userData</td>
<td>Converted to GSM format.</td>
</tr>
</tbody>
</table>

**Call input operation (positive result) (4.2.1)**

Messaging Manager complies.

The message is converted to a GenericSMResponse with the parameter conversions listed in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSMResult location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACK</td>
<td>resultCode</td>
<td>• If commandStatus = 0, ACK = 'A'. • If commandStatus ≠ 0, ACK = 'N'.</td>
</tr>
<tr>
<td>SM</td>
<td>deliverReceiptId</td>
<td>Stored text is AdC:SCTS</td>
</tr>
</tbody>
</table>

**Call input operation (negative result) (4.2.2)**

Messaging Manager does not comply.

Message properties are stored in the same places as those of the positive result in Call input operation (positive result). However the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

**Multiple address call input operation -02 (4.3)**

Messaging Manager complies.

**Note:** The OAdC parameter is optional in the EMI specification but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages unless the OAdC parameter is present.

• Each terminating address is converted directly to a GenericSM.
The GenericSM message type is set to *Submit*.
No check is made on the limit of 20 destinations.
See *Call input operation -01 (4.2)* (on page 10) for the stored location of each parameter.
Legitimisation codes are ignored by Messaging Manager.

**Multiple address call input operation (positive result) (4.3.1)**

Messaging Manager does not comply.

_The Specification_ does not define what a -02 result means.

It could mean 'the SMSC has accepted your request', or 'all destinations terminated successfully', or something else. If the second interpretation is assumed, then a NACK implies that at least one destination address failed. However _The Specification_ does not specify which one and a sensible retry cannot be attempted.

It seems reasonable to suppose that the second interpretation is incorrect. The real arbiter in these matters appears to be established use. That is, EMI is what a CMG SMSC does.

If Messaging Manager is forced to create a response, it is always positive. This means 'we have accepted your request' and the optional field SM is always set to "". Messaging Manager may be forced to create a response when all destination addresses terminate via another plugin. Otherwise the SMSC response is proxied verbatim.

**Multiple address call input operation (negative result) (4.3.2)**

Messaging Manager does not comply.

The EC field is generated in the same way as for a single address result and so suffers from the same problem. See *Call input operation (negative result) (4.2.2)* (on page 11).

The SM field is set to "".

**Call input with supplementary services operation -03 (4.4)**

Messaging Manager complies.

Messaging Manager does not construct call input with supplementary services operations unless it is creating an altered copy of one already passed in.

EMI messages are directly converted to and from GenericSM.

The GenericSM message type is set to *Submit*.

Individual message parameters and their internal storage locations are set out in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSM location</th>
<th>Comments</th>
</tr>
</thead>
</table>
| RAd           | destinationAddress | TON and NPI come from numberRules.  
• The legitimisation code is ignored. |
| OAdC          | sourceAddress      | TON and NPI come from numberRules.  
**Note:** The OAdC parameter is optional in _The Specification_ but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages without the OAdC parameter. |
| AC            |                     | Ignored by Messaging Manager.  
• Set to "" in generated outgoing messages. |
NPL | Set to 0.
---|---
GA:s | Ignored by Messaging Manager.
RP | Set to empty.
PR | Set to empty.
LPR | Set to empty.
UR | Set to empty.
LUR | Set to empty.
RC | Set to empty.
LRC | Set to empty.
DD | Not stored in GenericSM
DDT | Not stored in GenericSM
If DD =1, DDT is stored in smpp::MsgSubmitSM and allowAlternateDelivery is set to false.
MT | Not stored in SMPP or SMSubmit.
NMsg | userData Converted to GSM 7-bit format.
AMsg | userData Converted to GSM 7-bit format.

- The DD and DDT parameters are only preserved because allowAlternateDelivery is set to false. The original message is therefore available to the outgoing plugin.
- On the incoming message, no check is made to verify that fields that must be empty are in fact empty.

**Call input with supplementary services operation (positive result) (4.4.1)**

Messaging Manager complies.

The message is converted to a GenericSMResult with the parameter conversions listed in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSMResult location</th>
<th>Comments</th>
</tr>
</thead>
</table>
| ACK           | resultCode               | If commandStatus = 0, ACK = 'A'.
|               |                          | If commandStatus ≠ 0, ACK = 'N'. |
| SM            | deliverReceiptId         | Stored text is AdC:SCTS |

If the original message is not available in the outgoing plugin, SM is set to "".

**Call input with supplementary services operation (negative result) (4.4.2)**

Messaging Manager does not comply.

Message properties are stored in the same places as those of the positive result above. However the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

**MS message transfer operation -30 (4.5)**

Messaging Manager complies.
Messaging Manager does not construct an MS message transfer unless it is creating an altered copy of one already passed in.

EMI messages are directly converted to and from GenericSM.

The GenericSM message type is set to *Submit*.

Individual message parameters and their internal storage locations are set out in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSM location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdC</td>
<td>destinationAddress</td>
<td>TON and NPI come from numberRules.</td>
</tr>
</tbody>
</table>
| OAdC          | sourceAddress      | TON and NPI come from numberRules.  
|               |                    | *Note:* The OAdC parameter is optional in *The Specification* but mandatory for Messaging Manager. Messaging Manager cannot successfully handle incoming messages without the OAdC parameter. |
| AC            |                    | Ignored by Messaging Manager. Set to ‘’ on generated outgoing messages. |
| NRq           | Not stored.        | If true and NAd and NPID are not empty, allowAlternateDelivery is set to false. This makes NAd and NPID accessible to the outgoing plugin. |
| NAd           |                    |          |
| NPID          |                    |          |
| DD            | Not stored in genericSM. | If DD = 1, FDA and allowAlternateDelivery are set to false. The SMSC receiving this message is expected to perform the delayed delivery. |
| DDT           | Not stored in genericSM. |          |
| VP            | validityperiod     |          |
| AMsg          | userData           | Converted to GSM 7-bit format. |

**MS message transfer operation (positive result) (4.5.1)**

Messaging Manager complies.

The message is converted to GenericSMResult with the parameter conversions set out in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSMResult location</th>
<th>Comments</th>
</tr>
</thead>
</table>
| ACK           | resultCode               | • If commandStatus = 0, ACK = ’A’ .  
|               |                          | • If commandStatus ≠ 0, ACK = ’N’ . |
| MVP           | deliverReceiptId         | Ignored by Messaging Manager. |
| SM            |                          | Stored text is AdC:SCTS. |

If the original message is not available in the outgoing plugin, SM is set to ‘’.

**MS message transfer operation (negative result) (4.5.2)**

Messaging Manager complies.
• If it is available on the outgoing plugin, the original message is correctly recreated. If the message
is not available it is set to ‘4’.
• Message properties are stored in the same places as those of MS message transfer operation
(positive result).
• The EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause
of the genericSMResult of EMI error code.

**MT alert operation -31 (4.6)**

Messaging Manager does not comply.
• To determine the number of outstanding calls, the alert message is not passed on to the SC.
  Instead the message is immediately responded to with 0 outstanding messages.
• Outgoing alert messages are used as link heartbeats, with the AdC and PID coming from the plugin
  configuration options alertAddress and alertPID. The default alertPID is 639.

**MT alert operation (positive result) (4.6.1)**

Messaging Manager does not comply.
The returned SM is always "0000".
Receipt of these messages by Messaging Manager is only used to reset the heartbeat timer.

**MT alert operation (negative result) (4.6.2)**

Messaging Manager does not comply.
MT alert operation (negative result) messages are never sent by Messaging Manager. Receipt of one
simply resets the link heartbeat timer.

**Specification Section 5**

**Introduction**

Statements of compliance for clauses of Section 5 of The Specification follow.

**50-Series of EMI Messages (5)**

Messaging Manager complies.
• Not all 50-series messages are actively processed by the high level Messaging Manager trigger;
  some are simply forwarded directly, unchanged. But all messages are handled.
• Directly forwarded messages terminate via the inbound path's relay.
Details of specific messages are covered in the following Section 5 conformance statements.

**Abstract Data Types (5.1)**

Messaging Manager complies.
• When it stores 50-series messages, Messaging Manager uses the concept of abstract data types.
• Result messages also use the concept of abstract data types.
The use of each parameter is covered in the following compliance statements for Section 5.
How to encode the alphanumeric OAdC (5.1.1.1)

Messaging Manager complies.

TC_PROTOS only supports BcdDigits. If TC_PROTOS contains characters other than digits, stars and hashes and it is sent to ACS, the OAdC field will be corrupted.

Description Of XSer Extra Services (5.1.2)

Messaging Manager complies.

The restriction that each service can only appear once in any message is enforced.

XSer Type of service 00, Not Used (5.1.2.1)

Messaging Manager complies.

XSer Type of service 01, GSM UDH information (5.1.2.2)

Messaging Manager complies.

XSer Type of service 01 is converted to octets and stored in the userDataHeader variable of GenericSM.

XSer Type of service 02, GSM DCS information (5.1.2.3)

Messaging Manager complies.

XSer Type of service 02 is used to construct the alphabet and message waiting variables of GenericSM.

XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4)

Messaging Manager does not comply.

- All but the urgency indicator are ignored by Messaging Manager.
- The urgency is investigated by Messaging Manager for both the GSM and TDMA networks.
- The urgency is gathered and set for type -53 messages when it should only be present for type -51 and type -52.
- XSer Types of Service 03-0B is stored in the priority field of a GenericSM.

The mapping from EMI priority to a GenericSM is described in the following table.

<table>
<thead>
<tr>
<th>EMI</th>
<th>GenericSM</th>
<th>EMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Normal</td>
<td>Interactive</td>
<td>Urgent</td>
</tr>
<tr>
<td>Urgent</td>
<td>Urgent</td>
<td>urgent</td>
</tr>
<tr>
<td>Very urgent</td>
<td>Emergency</td>
<td>Very urgent</td>
</tr>
</tbody>
</table>

XSer Type of service 0C: Billing Identifier (5.1.2.5)

Messaging Manager does not comply.

- This extension is examined for both type -51 and -52 messages. It should only be present in types -51 and -54.
- Outgoing type -51 messages will not have this field set. Because type -54 messages are unaltered, they will have this field set.
XSer Type of service 0D: Single Shot indicator (5.1.2.6)

Messaging Manager complies.
XSer Type of service 0D is stored in the GenericSM::singleShot parameter.

Standard string (5.2)

Messaging Manager complies.

Submit Short Message operation -51 (5.3)

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to Submit.

A compliance statement for each of the members of Submit Short Message operation -51 is listed in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSM location</th>
<th>Statement of compliance</th>
</tr>
</thead>
</table>
| AdC           | destinationAddress | Messaging Manager complies.  
                  TON and NPI come from numberRules. |
| OAdC          | sourceAddress      | Messaging Manager complies.  
                  Both alphanumeric and number formats are considered.  
                  - TON and NPI come from numberRules.  
                  - See How to encode the alphanumeric OAdC (5.1.1.1) (on page 16) for alphanumeric addresses. |
| AC            |                    | Messaging Manager does not comply.  
                  - Ignored by Messaging Manager.  
                  - Set to "" on generated outgoing messages. |
| NRq           | Not stored.        | Messaging Manager does not comply.  
                  If NRq is true, and NAdC and NPID are not empty, allowAlternateDelivery is set to false.  
                  This allows NAdC and NPID to be accessible to the outgoing plugin. |
| NAdC          |                    | Messaging Manager does not comply. |
| NT            | statusReportRequested | Messaging Manager complies.  
                  If BN is included, allowAlternateDelivery is set to false. |
| NPID          |                    | Messaging Manager does not comply.  
                  If it is present, allowAlternateDelivery is set to false. |
| LRq           |                    | Messaging Manager does not comply.  
                  If it is present, allowAlternateDelivery is set to 1 (false). |
<p>| LRAd          |                    | Messaging Manager does not comply. |
| LPID          |                    | Messaging Manager does not comply. |
| DD            | Not stored in GenericSM. | Messaging Manager does not comply. |</p>
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDT</td>
<td>Not stored in GenericSM.</td>
<td>Messaging Manager does not comply.</td>
</tr>
<tr>
<td>VP</td>
<td>validityPeriod</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>RPID</td>
<td>protocolIdentifier</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>MT</td>
<td>Used to determine the decoding of shortMessage. Reconstructed for outgoing messages.</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>NMsg</td>
<td>userData</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>AMsg</td>
<td>userData</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>NB</td>
<td>Used to determine the decoding of shortMessage. Reconstructed for outgoing messages.</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>TMsg</td>
<td>userData</td>
<td>Messaging ManagerMX complies.</td>
</tr>
<tr>
<td>MMS</td>
<td>Maritime Message Access (MMS)</td>
<td>Messaging Manager ignores MMS.</td>
</tr>
<tr>
<td>PR</td>
<td>priorityIndicator</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>DCs</td>
<td></td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>MCLs</td>
<td>messageClass</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>RPI</td>
<td>provideReplypath</td>
<td>Messaging Manager complies.</td>
</tr>
<tr>
<td>OTOA</td>
<td></td>
<td>Messaging Manager does not comply.</td>
</tr>
<tr>
<td>XSer</td>
<td></td>
<td>See:</td>
</tr>
<tr>
<td></td>
<td>* Description Of XSer Extra Services (5.1.2) (on page 16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* XSer Type of service 00, Not Used (5.1.2.1) (on page 16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* XSer Type of service 01, GSM UDH information (5.1.2.2) (on page 16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* XSer Type of service 02, GSM DCS information (5.1.2.3) (on page 16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4) (on page 16)</td>
<td></td>
</tr>
</tbody>
</table>
XSer Type of service 0C: Billing Identifier (5.1.2.5) (on page 16)
XSer Type of service 0D: Single Shot indicator (5.1.2.6) (on page 17)

No check is made on the MT value if RPID is 0127.

Submit Short Message operation (positive result) (5.3.1)

Messaging Manager complies.
Messaging Manager ignores the MVP paramater.
Parameters in the positive result data field are set out in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>genericSM location</th>
<th>Comments</th>
</tr>
</thead>
</table>
| ACK           | resultCode         | If commandStatus = 0, ACK = 'A'.  
|               |                    | If commandStatus \neq 0, ACK = 'N'. |
| MVP           |                    |          |
| SM            | deliverReceiptId   | • Stored text is AdC:SCTS.  
|               |                    | • Set by Messaging Manager.  
|               |                    | • SCTS is at most 30 seconds ahead of wall time. |

Submit Short Message operation (negative result) (5.3.2)

Messaging Manager complies.

- Message properties are stored in the same place as those of Submit Short Message operation (positive result).
- For Messaging Manager version 2.2, in the intermediate form of the EC, EC is represented by the smpp::commandStatus. There is no addition of 0x400 as in type -01 messages.
- For Messaging Manager version 3.1.1, the EC is obtained from the action and error codes configuration mapping of the CS1ReleaseCause of the genericSMResult to EMI error code.

Delivery Short Message operation -52 (5.4)

Messaging Manager complies.

Note: Messaging Manager accepts type -52 message with a billingIdentifier. This functionality does not comply with The Specification. However in practice, if all other network users are compliant, Messaging Manager will never receive a type -52 message with a billingIdentifier and The Specification will not be violated.

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to Deliver.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>GenericSM location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdC</td>
<td>destinationAddress</td>
<td>TON and NPI come from numberRules.</td>
</tr>
</tbody>
</table>
| OAdC          | sourceAddress      | • Both alphanumeric and number formats are considered.  
|               |                    | • TON and NPI come from numberRules.  
|               |                    | • See How to encode the alphanumeric OAdC (5.1.1.1) (on page 16) for |
### External Machine Interface (EMI) Protocol Implementation Conformance Statement

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPID</td>
<td>protocolIdentifier</td>
</tr>
<tr>
<td>SCTS</td>
<td>Outgoing messages have the current SCP time (in GenericSM's user time zone) in the SCTS field.</td>
</tr>
</tbody>
</table>
| MT | • Used to determine the decoding of shortMessage.  
   • Reconstructed for outgoing messages. |
| NMsg | userData | Converted to GSM 7-bit format. |
| AMsg | userData | Converted to GSM 7-bit format. |
| NB | • Used to determine the decoding of shortMessage.  
   • Reconstructed for outgoing messages. |
| TMsg | userData | Stored as binary of UCS-2 format. |
| MNS | Ignored by Messaging Manager, so not compliant. |
| DCs | Set to blank on outgoing messages. |
| MCLs | messageClass | Not set for constructed messages. The xSer DCS is used in preference. |
| RPI | provideReplyPath | If non-zero, set allowAlternateDelivery to false. |
| HPLMN | Ignored by Messaging Manager | Read only if provideVMSInHPLMN configuration option is set. |
| XSer | See:  
  * Description Of XSer Extra Services (5.1.2) (on page 16)  
  * XSer Type of service 00, Not Used (5.1.2.1) (on page 16)  
  * XSer Type of service 01, GSM UDH information (on page 16)  
  * XSer Type of service 02, GSM DCS information (5.1.2.3) (on page 16)  
  * XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4) (on page 16)  
  * XSer Type of service 0C: Billing Identifier (5.1.2.5) (on page 16)  
  * XSer Type of service 0D: Single Shot indicator (5.1.2.6) (on page 17) |

### Delivery Short Message operation (positive result) (5.4.1)

Messaging Manager complies.

The positive result data field is handled the same way as a type-51 response. See *Submit Short Message operation (positive result) (5.3.1)* (on page 19).

### Delivery Short Message operation (negative result) (5.4.2)

Messaging Manager complies.
The negative result data field is handled the same way as a type -51 response. See *Submit Short Message operation (negative result)* (5.3.2) (on page 19).

**Delivery notification operation -53 (5.5)**

Messaging Manager complies.

- EMI messages are directly converted to and from GenericSM.
- The GenericSM message type is set to Notify and message contents set to Delivery receipt.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>SMSSubmit location</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adc</td>
<td>destinationAddress</td>
<td>TON and NPI come from numberRules.</td>
</tr>
</tbody>
</table>
| OAdC          | sourceAddress      | ● Both alphanumeric and number formats are considered.  
                |                     | ● TON and NPI come from numberRules.  
                |                     | ● See *How to encode the alphanumeric OAdC* (5.1.1.1) (on page 16) for alphanumeric addresses. |
| SCTS          |                    | Outgoing messages contain the submission time stamp of the -51 message to which they refer. The timestamp is derived from the SM field of the -51 response to the ASP. |
| Dst           | DeliverySucceeded  | DeliverySucceeded is a Boolean variable. The Dst value is lost for outgoing transactions. Outgoing value is 0 or 2. |
| Rsn           | DeliverySucceeded  | DeliverySucceeded is a Boolean variable. The Rsn value is lost for outgoing transactions. Outgoing value is 108. |
| DSCTS         |                    | Outgoing messages have the current SCP time (in the SMSSubmit’s user time zone) in the DSCTS field. |
| MT            |                    | ● Used to determine the decoding of shortMessage.  
                |                     | ● Reconstructed for outgoing messages. |
| NMsg          | userData           | Converted to GSM 7-bit format. |
| AMsg          | userData           | Converted to GSM 7-bit format. |
| HPLMN         | Ignored by Messaging Manager | Only read if the provideVMSCHPN configuration option is set. |
| XSer          |                    | See See:  
                |                     | ● *Description Of XSer Extra Services* (5.1.2) (on page 16)  
                |                     | ● *XSer Type of service 00, Not Used* (5.1.2.1) (on page 16)  
                |                     | ● *XSer Type of service 01, GSM UDH information* (5.1.2.2) (on page 16)  
                |                     | ● *XSer Type of service 02, GSM DCS information* (5.1.2.3) (on page 16)  
                |                     | ● *XSer Types of Service 03-0B, TDMA information exchange* (5.1.2.4) (on page 16)  
                |                     | ● *XSer Type of service 0C: Billing Identifier* (5.1.2.5) (on page 16) |
Chapter 2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Delivery Notification operation (positive result) (5.5.1)

Messaging Manager complies.

The positive result data field is handled in the same way as a type -51 response. See Submit Short Message operation (positive result) (5.3.1) (on page 19).

Delivery Notification operation (negative result) (5.5.2)

Messaging Manager complies.

The negative result data field is handled in the same way as a type -51 response. See Submit Short Message operation (negative result) (5.3.2) (on page 19).

Modify Short Message operation - 54 (5.6)

Messaging Manager does not comply.

Messaging Manager does not support these messages. On receiving one, Messaging Manager responds with an error message, EC = 3 ("Permanent: Operation not supported by system"). This is because type -54 operations refer to the delivered message via the time stamp returned in the SM field of the type -51 operation. Early ack requires Messaging Manager to store persistent data in order to proxy this time stamp. Supporting early ack for type -54 operations is too expensive with the current pStore implementation. See also CTS 18625.

Modify Short Message operation (positive result) (5.6.1)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Modify Short Message operation (negative result) (5.6.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

Inquiry message operation -55 (5.7)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Inquiry message operation (positive result) (5.7.1)

Messaging Manager complies.
Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

**Inquiry message operation (negative result) (5.7.2)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

**Delete message operation -56 (5.8)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

**Delete message operation (positive result) (5.8.1)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

**Delete message operation (negative result) (5.8.2)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

**Response Inquiry message operation -57 (5.9)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.

**Response inquiry message operation (positive result) (5.9.1)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

**Response inquiry message operation (negative result) (5.9.2)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

**Response delete message operation -58 (5.10)**

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMT, unmodified.
Response delete message operation (positive result) (5.10.1)

Messaging Manager complies.

v does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Response delete message operation (negative result) (5.10.2)

Messaging Manager complies.

Messaging Manager does not process these messages. On receiving one, Messaging Manager simply passes it on to the SMSC, unmodified.

Specification Section 6

Introduction

Statements of compliance for clauses of Section 6 of The Specification follow.

60-Series of EMI Messages (6)

Messaging Manager does not comply.

- Only one sub type of the type -60 message is supported.
- Message type -61 is not supported.

Details of specific messages are covered in the following Section 6 conformance statements.

Abstract Data Types (6.1)

Messaging Manager complies.

Messaging Manager uses the concept of abstract data types in storing 60-series messages. The use of each parameter is covered in the following compliance statements for Section 6.

Standard string (6.2)

Messaging Manager complies.

Session management operation -60 (6.3)

Messaging Manager does not comply.

Only open session commands are processed and then only if the Messaging Manager state is WaitingSessionManagementMessage. All others are responded to with EC = 3 ("Operation not supported on this system").

Individual members of the session management operation are listed in the following table.

<table>
<thead>
<tr>
<th>EMI parameter</th>
<th>Messaging Manager handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAdC</td>
<td>Used as loginName.</td>
</tr>
<tr>
<td>OTON</td>
<td>Ignored by Messaging Manager.</td>
</tr>
<tr>
<td>ONPI</td>
<td>Ignored by Messaging Manager.</td>
</tr>
<tr>
<td>STYP</td>
<td>Only STYP=1 (open session) is handled.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>PWD</strong></td>
<td>Used as loginPassword.</td>
</tr>
</tbody>
</table>
| **NPWD** | • Ignored by Messaging Manager.  
• Blank for outgoing messages. |
| **VERS** | • Ignored by Messaging Manager.  
• Set to 100 for outgoing messages. |
| **OPID** | • Ignored by Messaging Manager.  
• Set to 39 for outgoing messages. |

**Session management operation (positive result) (6.3.1)**

Messing Manager complies.
Outgoing messages have a blank system message.

**Session management operation (negative result) (6.3.2)**

Messing Manager complies.
• Except for their ACK/NACK status, incoming messages are not parsed.
• Outgoing messages have EC of any one of the following three values:
  0 (success),  
  3 (Messaging Manager in wrong state), or  
  7 (all other errors).

**Provisioning actions operation -61 (6.4)**

Messing Manager does not comply.
• Messaging Manager responds to all type -61 incoming messages with an error message; EC = 3 (operation not supported).
• These messages are never sent out by Messaging Manager.

**Provisioning actions operation (positive result) (6.4.1)**

Messing Manager does not comply.
• Messaging Manager should never receive type -61 messages.
• Receipt of a type -61 message causes a cmmError.
• Messaging Manager never sends a type -61 message.

**Provisioning actions operation (negative result) (6.4.2)**

Messing Manager does not comply.
• Messaging Manager should never receive type -61 messages.
• If it does receive a type -61 message:
  • Messaging Manager raises a cmmError,  
  • Messaging Manager constructs a response, compliant with *The Specification*, and  
  • Messaging Manager responds with an error message, EC = 3.
• Messaging Manager never sends a type -61 message.
Specification Section 7

Introduction

Statements of compliance with clauses of Section 7 of The Specification follow.

Error Codes Overview (7)

Messaging Manager complies.

Error codes (7.1)

Messaging Manager complies.

The only errorCodes that Messaging Manager explicitly constructs are 0, 3, 4, 6 and 7. All other errors come from:

- Unaltered messages passed through Messaging Manager.
- The ACS release cause mapping which is configured via the action and error codes configuration option.
- The configured throttledErrorCode; that is, the error code returned whenever a message is throttled by Messaging Manager.
- The configured transientFailureErrorCode; that is, the error code returned whenever a message delivery attempt returns a transient failure.
- The configured permanentFailureErrorCode; that is, the error code returned whenever the message delivery attempt returns a permanent failure.
NCC Glossary of Terms

AC
Application Context. A parameter in a TCAP message which indicates what protocol is conveyed. May indicate, for example, MAP, CAMEL, or INAP. Also usually specifies the particular version of the conveyed protocol, for example, which CAMEL Phase.

ACS
Advanced Control Services configuration platform.

AS
Application Server. The logical entity serving a SUA routing key. An AS is equivalent to an SS7 end point (for example, HLR, MSC,…). An AS contains, at least, one ASP.

ASP
- Application Service Provider, or

CAMEL
Customized Applications for Mobile network Enhanced Logic
This is a 3GPP (Third Generation Partnership Project) initiative to extend traditional IN services found in fixed networks into mobile networks. The architecture is similar to that of traditional IN, in that the control functions and switching functions are remote. Unlike the fixed IN environment, in mobile networks the subscriber may roam into another PLMN (Public Land Mobile Network), consequently the controlling function must interact with a switching function in a foreign network. CAMEL specifies the agreed information flows that may be passed between these networks.

Diameter
A feature rich AAA protocol. Utilises SCTP and TCP transports.

EMI
Exchange Message Interface protocol

FDA
First Delivery Attempt - the delivery of a short message directly to the SME rather than relaying it through the MC.

GSM
Global System for Mobile communication.
It is a second generation cellular telecommunication system. Unlike first generation systems, GSM is digital and thus introduced greater enhancements such as security, capacity, quality and the ability to support integrated services.
**HLR**

The Home Location Register is a database within the HPLMN (Home Public Land Mobile Network). It provides routing information for MT calls and SMS. It is also responsible for the maintenance of user subscription information. This is distributed to the relevant VLR, or SGSN (Serving GPRS Support Node) through the attach process and mobility management procedures such as Location Area and Routing Area updates.

**HPLMN**

Home PLMN

**HTML**

HyperText Markup Language, a small application of SGML used on the World Wide Web.

It defines a very simple class of report-style documents, with section headings, paragraphs, lists, tables, and illustrations, with a few informational and presentational items, and some hypertext and multimedia.

**IN**

Intelligent Network

**INAP**

Intelligent Network Application Part - a protocol offering real time communication between IN elements.

**MAP**

Mobile Application Part - a protocol which enables real time communication between nodes in a mobile cellular network. A typical usage of the protocol would be for the transfer of location information from the VLR to the HLR.

**MC**

Message Centre. Also known as SMSC.

**Messaging Manager**

The Messaging Manager service and the Short Message Service components of Oracle Communications Network Charging and Control product. Component acronym is MM (formerly MMX).

**MM**

Messaging Manager. Formerly MMX, see also XMS (on page 30) and Messaging Manager (on page 28).

**MS**

Mobile Station

**MSC**

Mobile Switching Centre. Also known as a switch.

**MT**

Mobile Terminated
NPI
Number Plan Indicator

Oracle
Oracle Corporation

Peer
Remote machine, which for our purposes is capable of acting as a Diameter agent.

PLMN
Public Land Mobile Network

SCP
Service Control Point. Also known as SLC.

SGML

SLC
Service Logic Controller (formerly UAS).

SLEE
Service Logic Execution Environment

SME
Short Message Entity - an entity which may send or receive Short Messages. It may be located in a fixed network, a mobile, or an SMSC.

SMP
Service Management Platform (also referred to as SMS).

SMPP
Short Message Peer-to-Peer protocol

SMS
Depending on context, can be:

- Short Message Service
- Service Management System platform
- NCC Service Management System application
SMSC
Short Message Service Centre - stores and forwards a short message to the indicated destination subscriber number.

TCAP
Transaction Capabilities Application Part – layer in protocol stack, message protocol.

TDMA
Time Division Multiple Access - a communications technique that uses a common channel for communications among multiple users by allocating each a unique time slot.

VLR
Visitor Location Register - contains all subscriber data required for call handling and mobility management for mobile subscribers currently located in the area controlled by the VLR.

XMS
Three letter code used to designate some components and path locations used by the Oracle Communications Network Charging and Control Messaging Manager (on page 28) service and the Short Message Service. The published code is MM (on page 28) (formerly MMX).
Index

5
50-Series of EMI Messages (5) • 16

6
60-Series of EMI Messages (6) • 25

A
About This Document • v
Abstract Data Types (5.1) • 16
Abstract Data Types (6.1) • 25
AC • 29
ACS • 29
Address syntax (4.1) • 10
AS • 29
ASP • 29
Audience • v

C
Call input operation (negative result) (4.2.2) • 11, 12
Call input operation (positive result) (4.2.1) • 11
Call input operation -01 (4.2) • 10, 12
Call input with supplementary services
operation (negative result) (4.4.2) • 14
Call input with supplementary services
operation (positive result) (4.4.1) • 13
Call input with supplementary services
operation -03 (4.4) • 12
CAMEL • 29
checksum • 10
CMG • 8
CMG document • 8
CMG References • 9
Compliance Statement • 9
Convention • 9
Copyright • ii

D
data • 10
Delete message operation (negative result) (5.8.2) • 24
Delete message operation (positive result) (5.8.1) • 24
Delete message operation -56 (5.8) • 24
Delivery Notification operation (negative result) (5.5.2) • 23
Delivery Notification operation (positive result) (5.5.1) • 23
Delivery notification operation -53 (5.5) • 22
Delivery Short Message operation (negative result) (5.4.2) • 21
Delivery Short Message operation (positive result) (5.4.1) • 21
Delivery Short Message operation -52 (5.4) • 20
Description Of XSer Extra Services (5.1.2) • 16, 19, 21, 22
Diameter • 29
Document Conventions • vi

E
EMI • 29
EMI Commands (3) • 10
Error codes (7.1) • 27
Error Codes Overview (7) • 27

F
FDA • 29
Flow control (3.3) • 10

G
GSM • 29

H
header • 9
HLR • 30
How to encode the alphanumeric OAdC
(5.1.1.1) • 16, 17, 20, 22
HPLMN • 30
HTML • 30

I
IN • 30
INAP • 30
Inquiry message operation (negative result) (5.7.2) • 24
Inquiry message operation (positive result) (5.7.1) • 24
Inquiry message operation -55 (5.7) • 23
Introduction • 9, 10, 16, 25, 27

M
MAP • 30
MC • 30
Messaging Manager • 7, 30, 32
Messaging Manager and CMG Document
Versions • 7
Messaging Manager implementation • 7
MM • 30, 32
Modify Short Message operation -54 (5.6) • 23
Modify Short Message operation (negative result) (5.6.2) • 23
Modify Short Message operation (positive result) (5.6.1) • 23
MS • 30
MS message transfer operation (negative result) (4.5.2) • 15
MS message transfer operation (positive result) (4.5.1) • 15
MS message transfer operation -30 (4.5) • 14
MSC • 30
MT • 30
MT alert operation (negative result) (4.6.2) • 15
MT alert operation (positive result) (4.6.1) • 15
MT alert operation -31 (4.6) • 15
Multiple address call input operation (negative result) (4.3.2) • 12
Multiple address call input operation (positive result) (4.3.1) • 12
Multiple address call input operation -02 (4.3) • 11
N
NPI • 31
Oracle • 31
Overview • 7, 9
P
Peer • 31
PLMN • 31
Provisioning actions operation (negative result) (6.4.2) • 26
Provisioning actions operation (positive result) (6.4.1) • 26
Provisioning actions operation -61 (6.4) • 26
R
Response delete message operation (negative result) (5.10.2) • 25
Response delete message operation (positive result) (5.10.1) • 25
Response delete message operation -58 (5.10) • 25
Response inquiry message operation (negative result) (5.9.2) • 24
Response inquiry message operation (positive result) (5.9.1) • 24
Response Inquiry message operation -57 (5.9) • 24
S
Scope • v
SCP • 31
Session management operation (negative result) (6.3.2) • 26
Session management operation (positive result) (6.3.1) • 26
Session management operation -60 (6.3) • 25
SGML • 31
SLC • 31
SLEE • 31
SME • 31
SMP • 31
SMPP • 31
SMS • 31
SMSC • 32
SMSC initiated commands (3.2) • 10
SMT initiated commands (3.1) • 10
Specification Section 4 • 10
Specification Section 5 • 16
Specification Section 6 • 25
Specification Section 7 • 27
Specification Sections 2 and 3 • 9
Standard string (5.2) • 17
Standard string (6.2) • 25
Structure of EMI Messages (2) • 9
stx and etx • 9
Submit Short Message operation (negative result) (5.3.2) • 20, 21, 23
Submit Short Message operation (positive result) (5.3.1) • 19, 21, 23
Submit Short Message operation -51 (5.3) • 17
T
TCAP • 32
TDMA • 32
Typographical Conventions • vi
V
VLR • 32
X
XMS • 30, 32
XSer Type of service 00, Not Used (5.1.2.1) • 16, 19, 21, 22
XSer Type of service 01, GSM UDH information (5.1.2.2) • 16, 19, 21, 22
XSer Type of service 02, GSM DCS information (5.1.2.3) • 16, 19, 21, 22
XSer Type of service 0C Billing Identifier (5.1.2.5) • 17, 19, 21, 22
XSer Type of service 0D Single Shot indicator (5.1.2.6) • 17, 19, 21, 22
XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4) • 16, 19, 21, 22

Scope • v
SCP • 31
Session management operation (negative result) (6.3.2) • 26
Session management operation (positive result) (6.3.1) • 26
Session management operation -60 (6.3) • 25
SGML • 31
SLC • 31
SLEE • 31
SME • 31
SMP • 31
SMPP • 31
SMS • 31
SMSC • 32
SMSC initiated commands (3.2) • 10
SMT initiated commands (3.1) • 10
Specification Section 4 • 10
Specification Section 5 • 16
Specification Section 6 • 25
Specification Section 7 • 27
Specification Sections 2 and 3 • 9
Standard string (5.2) • 17
Standard string (6.2) • 25
Structure of EMI Messages (2) • 9
stx and etx • 9
Submit Short Message operation (negative result) (5.3.2) • 20, 21, 23
Submit Short Message operation (positive result) (5.3.1) • 19, 21, 23
Submit Short Message operation -51 (5.3) • 17
TCAP • 32
TDMA • 32
Typographical Conventions • vi
VLR • 32
XMS • 30, 32
XSer Type of service 00, Not Used (5.1.2.1) • 16, 19, 21, 22
XSer Type of service 01, GSM UDH information (5.1.2.2) • 16, 19, 21, 22
XSer Type of service 02, GSM DCS information (5.1.2.3) • 16, 19, 21, 22
XSer Type of service 0C Billing Identifier (5.1.2.5) • 17, 19, 21, 22
XSer Type of service 0D Single Shot indicator (5.1.2.6) • 17, 19, 21, 22
XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4) • 16, 19, 21, 22

Scope • v
SCP • 31
Session management operation (negative result) (6.3.2) • 26
Session management operation (positive result) (6.3.1) • 26
Session management operation -60 (6.3) • 25
SGML • 31
SLC • 31
SLEE • 31
SME • 31
SMP • 31
SMPP • 31
SMS • 31
SMSC • 32
SMSC initiated commands (3.2) • 10
SMT initiated commands (3.1) • 10
Specification Section 4 • 10
Specification Section 5 • 16
Specification Section 6 • 25
Specification Section 7 • 27
Specification Sections 2 and 3 • 9
Standard string (5.2) • 17
Standard string (6.2) • 25
Structure of EMI Messages (2) • 9
stx and etx • 9
Submit Short Message operation (negative result) (5.3.2) • 20, 21, 23
Submit Short Message operation (positive result) (5.3.1) • 19, 21, 23
Submit Short Message operation -51 (5.3) • 17
TCAP • 32
TDMA • 32
Typographical Conventions • vi
VLR • 32
XMS • 30, 32
XSer Type of service 00, Not Used (5.1.2.1) • 16, 19, 21, 22
XSer Type of service 01, GSM UDH information (5.1.2.2) • 16, 19, 21, 22
XSer Type of service 02, GSM DCS information (5.1.2.3) • 16, 19, 21, 22
XSer Type of service 0C Billing Identifier (5.1.2.5) • 17, 19, 21, 22
XSer Type of service 0D Single Shot indicator (5.1.2.6) • 17, 19, 21, 22
XSer Types of Service 03-0B, TDMA information exchange (5.1.2.4) • 16, 19, 21, 22