
**Information technology —
Telecommunications and information
exchange between systems — Private
Integrated Services Network — Inter-
exchange signalling protocol — Message
centre monitoring and mailbox
identification supplementary services**

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*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé à intégration de
services — Protocole de signalisation d'échange — Services
supplémentaires de surveillance du centre du message et
d'identification de boîte aux lettres*

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Contents

Page

Foreword.....	v
Introduction	vi
1 Scope.....	1
2 Conformance	1
3 Normative references	2
4 Terms and definitions.....	3
4.1 External definitions.....	3
4.2 Other definitions	3
5 Acronyms.....	4
6 Signalling protocol for the support of SS-MCM.....	4
6.1 SS-MCM description	4
6.2 SS-MCM operational requirements	4
6.3 SS-MCM coding requirements.....	5
6.4 SS-MCM state definitions.....	13
6.5 SS-MCM signalling procedures	13
6.6 SS-MCM impact of interworking with public ISDNs.....	20
6.7 SS-MCM impact of interworking with non-ISDNs.....	21
6.8 Protocol interactions between SS-MCM and other supplementary services and ANFs	21
6.9 SS-MCM parameter values (timers).....	24
7 Signalling protocol for the support of SS-MID.....	25
7.1 SS-MID description	25
7.2 SS-MID operational requirements	25
7.3 SS-MID coding requirements.....	26
7.4 SS-MID state definitions	28
7.5 SS-MID signalling procedures	29
7.6 SS-MID impact of interworking with public ISDNs	31
7.7 SS-MID impact of interworking with non-ISDNs	31
7.8 Protocol interactions between SS-MID and other supplementary services and ANFs	31
7.9 SS-MID parameter values (timers).....	34
Annex A (normative) Protocol Implementation Conformance Statement (PICS) Proforma	35
A.1 Introduction	35
A.2 Instructions for completing the PICS proforma.....	35
A.3 PICS proforma for SS-MCM.....	37
A.4 PICS proforma for SS-MID.....	41
Annex B (informative) Examples of Message Sequences.....	44
B.1 Example message sequence for SS-MCM.....	45
B.2 Example message sequences for interworking between for SS-MCM and SS-MWI.....	53
B.3 Example message sequence for SS-MID.....	62
Annex C (informative) Specification and Description Language (SDL) Representation of Procedures	64
C.1 SDL representation of SS-MCM at the Message Centre PINX.....	65
C.2 SDL representation of SS-MCM at the Served User PINX.....	72
C.3 SDL representation of SS-MID at the Message Centre PINX.....	79
C.4 SDL representation of SS-MID at the Served User PINX.....	82

Annex D (informative) List of Message Types	84
D.1 Telephony Type Messages	84
D.2 Data Type Messages	84
D.3 Combination of Messages	85
D.4 Additional Message Types	85

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 20117 was prepared by ECMA (as ECMA-347) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

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Introduction

This International Standard is one of a series defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC.

This International Standard specifies the signalling protocol for use at the Q reference point in support of the Message Centre Monitoring supplementary service as well as the Mailbox Identification supplementary service. The protocol defined in this International Standard forms part of the PSS1 protocol (informally known as QSIG).

SS-MCM is based on SS-MWI and includes its entire functionality. The interoperability with SS-MWI is therefore guaranteed. Compared to SS-MWI, SS-MCM offers an enhanced functionality for monitoring status changes of messages stored in the Served User's Mailbox as follows:

- individual activation and deactivation for the monitoring of messages of different Message Type(s) within the Mailbox as well as interrogation of the actual SS-MCM configuration;
- retrieval of information about all messages (i.e. new and retrieved messages) in the mailbox independent of the Message Status;
- request of detailed updated information about messages stored in the mailbox.

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

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Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Message centre monitoring and mailbox identification supplementary services

1 Scope

This International Standard specifies the signalling protocol for the support of the Message Centre Monitoring supplementary service (SS-MCM) as well as the Mailbox Identification supplementary service (SS-MID) at the Q reference point between Private Integrated Services Network eXchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

The supplementary service MCM enables a Served User to get informed by a Message Centre about the status and status changes of messages stored in that Served Users Mailbox.

The supplementary service MID enables a Message Centre to identify a specific mailbox of a Served User in case the Served User has more than one mailbox within the Message Centre. In addition SS-MID enables a Served User to authenticate himself/herself at a specific mailbox located within the Messages Centre.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in ETS 300 387. This International Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ISO/IEC 20116.

The signalling protocol for SS-MCM and SS-MID uses certain aspects of the generic procedures for the control of supplementary services specified in ISO/IEC 11582.

This International Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-MCM as well as SS-MID and other supplementary services and ANFs.

NOTE Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specifications.

2 Conformance

In order to conform to this International Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in Annex A.

Conformance to this International Standard includes conforming to those clauses that specify protocol interactions between SS-MCM as well as SS-MID and other supplementary services and ANFs for which signalling protocols at the Q reference point are supported in accordance with the stage 3 standards concerned.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 11572:2000, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Circuit mode bearer services — Inter-exchange signalling procedures and protocol*

ISO/IEC 11574:2000, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Circuit-mode 64 kbit/s bearer services — Service description, functional capabilities and information flows*

ISO/IEC 11579-1:1994, *Information technology — Telecommunications and information exchange between systems — Private integrated services network — Part 1: Reference configuration for PISN Exchanges (PINX)*

ISO/IEC 11582:2002, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Generic functional protocol for the support of supplementary services — Inter-exchange signalling procedures and protocol*

ISO/IEC 13873:2003, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Call Diversion supplementary services*

ISO/IEC 15505:2003, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Message Waiting Indication supplementary service*

ISO/IEC 15506:2003, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Inter-exchange signalling protocol — Message Waiting Indication supplementary service*

ISO/IEC 20116:2004, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Specification, functional model and information flows — Message centre monitoring and mailbox identification supplementary services*

ISO 8601:2000, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ETS 300 387:1994, *Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services*

ITU-T Rec. I.112:1993, *Vocabulary of terms for ISDNs*

ITU-T Rec. I.210:1993, *Principles of telecommunication services supported by an ISDN and the means to describe them*

ITU-T Rec. Q.950:2000, *Digital Subscriber Signalling System No. 1 (DSS 1) — Supplementary services protocols, structure and general principles*

ITU-T Rec. Z.100:1999, *Specification and Description Language*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1 External definitions

This International Standard uses the following terms defined in other documents:

— Address Header	(ISO/IEC 20116)
— Application Protocol Data Unit (APDU)	(ISO/IEC 11582)
— Call-Independent	(ISO/IEC 11582)
— Complete Information	(ISO/IEC 20116)
— Compressed Information	(ISO/IEC 20116)
— Gateway PINX	(ISO/IEC 11582)
— Mailbox	(ISO/IEC 20116)
— Message Centre (MC)	(ISO/IEC 20116)
— Message Status	(ISO/IEC 20116)
— Message Type	(ISO/IEC 20116)
— Message Waiting Signal	(ISO/IEC 20116)
— New Message	(ISO/IEC 20116)
— Originating PINX	(ISO/IEC 11582)
— Private Integrated services Network eXchange (PINX)	(ISO/IEC 11579-1)
— Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
— Retrieved Message	(ISO/IEC 20116)
— Served User	(ISO/IEC 20116)
— Signalling	(ITU-T Rec. I.112)
— Supplementary Service	(ITU-T Rec. I.210)
— Supplementary Service Control Entity	(ISO/IEC 11582)
— Terminating PINX	(ISO/IEC 11582)
— Transit PINX	(ISO/IEC 11582)

4.2 Other definitions

4.2.1

Message Centre PINX

The PINX where the Message Centre is located.

4.2.2

Served User PINX

The PINX where the Served User is located.

5 Acronyms

ANF	Additional Network Feature
APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
ISDN	Integrated Services Digital Network
MCM	Message Centre Monitoring
MID	Mailbox Identification
NFE	Network Facility Extension
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated services Network eXchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SS	Supplementary Service

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6 Signalling protocol for the support of SS-MCM

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6.1 SS-MCM description

The supplementary service MCM enables a Message Centre to inform a registered Served User about the status and status changes of messages stored in the Served User's Mailbox. This can be due to the arrival of New Messages or due to the change of the Message Status of stored messages (e.g. retrieval or deletion of messages). Additionally the Served User can request the current status of the messages in the Mailbox from the Message Centre.

If there are new messages for the Served User stored in the mailbox, a Message Waiting Signal may be set at the Served User's terminal.

Additionally a Served User might activate, deactivate or interrogate Message Centre Monitoring individually for the different Message Types.

6.2 SS-MCM operational requirements

6.2.1 Requirements on a Message Centre PINX

Call establishment procedures for the incoming and outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for an Originating PINX and for a Terminating PINX, shall apply.

6.2.2 Requirements on a Served User PINX

Call establishment procedures for the incoming and outgoing side of an inter-PINX link and call release procedures, as specified in ISO/IEC 11572, shall apply.

Generic procedures for call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for a Terminating PINX and for an Originating PINX, shall apply.

6.2.3 Requirements on a Transit PINX

Basic Call procedures, specified in ISO/IEC 11572 for a Transit PINX, shall apply.

Generic procedures for call-independent control (connection-oriented) of supplementary services, as specified in ISO/IEC 11582 for a Transit PINX, shall apply.

6.3 SS-MCM coding requirements

6.3.1 Operations

The operations defined in Abstract Syntax Notation One (ASN.1) in Table 1 shall apply.

NOTE The coding includes the operations as defined in SS-MWI (ISO/IEC 15506) but with the new operations names of SS-MCM.

The following operations are identical in SS-MCM and SS-MWI:

SS-MCM operations		SS-MWI operations
mCMNewMsg	↔	mWIActivate
mCMNoNewMsg	↔	mWIDeactivate
mCMUpdateReq	↔	mWIInterrogate

Table 1 — Operations in support of SS-MCM

```

SS-MCM-Operations-asn1-97
{iso (1) identified-organization (3) icd-ecma (0012) standard (0)
qsig-message-centre-monitoring (347)
message-centre-monitoring-operations-asn1-97 (1)}

DEFINITIONS EXPLICIT TAGS ::=

BEGIN

IMPORTS
    OPERATION, ERROR FROM
        Remote-Operations-Information-Objects
        {joint-iso-itu-t remote-operations (4) informationObjects (5)
        version1 (0)}

    EXTENSION, Extension{} FROM
        Manufacturer-specific-service-extension-class-asn1-97
        {iso standard pss1-generic-procedures (11582)
        msi-class-asn1-97 (11)}

```

Table 1 — Operations in support of SS-MCM (continued)

	<pre> basicServiceNotProvided, userNotSubscribed, invalidServedUserNr FROM General-Error-List {itu-t (0) recommendation (0) q (17) 950 (950) general-error-list (1)} PresentedAddressUnscreened, PartyNumber FROM Addressing-Data-Elements-asn1-97 {iso standard pssl-generic-procedures (11582) addressing-data-elements-asn1-97 (20)} Name FROM Name-Operations-asn1-97 {iso standard pssl-name (13868) name-operations-asn1-97 (1)} ; </pre>
MCM-Operations	<pre> OPERATION ::= { mCMNewMsg mCMNoNewMsg mCMUpdate mCMUpdateReq mCMService mCMInterrogate mCMailboxFull } </pre>
mCMNewMsg	<pre> OPERATION ::= { ARGUMENT MCMNewMsgArg RESULT MCMDummyRes ERRORS {userNotSubscribed invalidServedUserNr basicServiceNotProvided unspecified} CODE local: 80} -- same code as for mWIAActivate in SS-MWI </pre>
mCMNoNewMsg	<pre> OPERATION ::= { ARGUMENT MCMNoNewMsgArg RESULT MCMDummyRes ERRORS {userNotSubscribed invalidServedUserNr basicServiceNotProvided unspecified} CODE local: 81} -- same code as for mWIDeactivate in SS- </pre>
MWI	
mCMUpdate	<pre> OPERATION ::= { ARGUMENT MCMUpdateArg RESULT MCMDummyRes ERRORS {userNotSubscribed invalidServedUserNr unspecified} CODE local: 115} </pre>

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Table 1 — Operations in support of SS-MCM (continued)

mCMUpdateReq	OPERATION ::= { ARGUMENT MCMUpdateReqArg RESULT MCMUpdateReqRes ERRORS {userNotSubscribed invalidServedUserNr basicServiceNotProvided unspecified} CODE local: 82} -- same code as for mWIInterrogate in SS-MWI
mCMService	OPERATION ::= { ARGUMENT MCMServiceArg RESULT MCMDummyRes ERRORS {userNotSubscribed invalidServedUserNr basicServiceNotProvided mCMModeNotProvided unspecified} CODE local: 116}
mCMInterrogate	OPERATION ::= { ARGUMENT MCMInterrogateArg RESULT MCMInterrogateRes ERRORS {userNotSubscribed invalidServedUserNr basicServiceNotProvided mCMModeNotProvided unspecified} CODE local: 117}
mCMailboxFull	OPERATION ::= { ARGUMENT MCMailboxFullArg RETURN RESULT FALSE ALWAYS RESPONDS FALSE CODE local: 118}
MCMailboxFullArg	::= SEQUENCE { partyInfo PartyInfo, mailboxFullFor MailboxFullFor, extensions MCMExtensions OPTIONAL, ... }
MailboxFullFor	::= SEQUENCE OF MailboxFullPar
MailboxFullPar	::= SEQUENCE { messageType MessageType, capacityReached INTEGER (0..100) OPTIONAL -- percentage of storage capacity already used }

Table 1 — Operations in support of SS-MCM (continued)

MCMServiceArg	::= SEQUENCE { partyInfo PartyInfo, mCMChange MCMChange, extensions MCMExtensions OPTIONAL, ... }
MCMChange	::= CHOICE { activateMCM [1] IMPLICIT SEQUENCE OF MCMServiceInfo, deactivateMCM [2] IMPLICIT SEQUENCE OF MessageType, setToDefaultValues NULL }
MCMServiceInfo	::= SEQUENCE { messageType MessageType, mCMModeNew [1] IMPLICIT MCMMode OPTIONAL, mCMModeRetrieved [2] IMPLICIT MCMMode OPTIONAL }
MCMInterrogateArg	::= SEQUENCE { partyInfo PartyInfo, interrogateInfo SEQUENCE OF MessageType, extensions MCMExtensions OPTIONAL, ... }
MCMInterrogateRes	::= SEQUENCE { interrogateResult SEQUENCE OF MCMServiceInfo, extensions MCMExtensions OPTIONAL, ... }
MCMNewMsgArg	::= SEQUENCE { servedUserNr PartyNumber, specificMessageType MessageType, msgCentreId MsgCentreId OPTIONAL, nrOfMessages [3] IMPLICIT NrOfMessages OPTIONAL, originatingNr [4] PartyNumber OPTIONAL, timestamp TimeStamp OPTIONAL, priority [5] IMPLICIT INTEGER (0..9) OPTIONAL, argumentExt CHOICE { extension [6] IMPLICIT Extension{ {MCMExtSet} }, multipleExtension [7] IMPLICIT SEQUENCE OF Extension{ {MCMExtSet} } } OPTIONAL }

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Table 1 — Operations in support of SS-MCM (continued)

MCMNoNewMsgArg	::= SEQUENCE { servedUserNr PartyNumber, specificMessageType MessageType, msgCentreId MsgCentreId OPTIONAL, argumentExt CHOICE { extension [3] IMPLICIT Extension{{MCMEExtSet}}, multipleExtension [4] IMPLICIT SEQUENCE OF Extension{{MCMEExtSet}} } OPTIONAL }
MCMUpdateArg	::= SEQUENCE { partyInfo PartyInfo, messageType MessageType, updateInfo UpdateInfo, moreInfoFollows BOOLEAN DEFAULT FALSE, extensions MCMEExtensions OPTIONAL, ... }
MCMUpdateReqArg	::= SEQUENCE { servedUserNr PartyNumber, specificMessageType MessageType, msgCentreId MsgCentreId OPTIONAL, argumentExt CHOICE { extension [3] IMPLICIT Extension{{MCMEExtSet}}, multipleExtension [4] IMPLICIT SEQUENCE OF Extension{{MCMEExtSet}} } OPTIONAL }
MCMUpdateReqRes	::= SEQUENCE SIZE (1..10) OF MCMUpdateReqResElt
MCMUpdateReqResElt	::= SEQUENCE { specificMessageType MessageType, msgCentreId MsgCentreId OPTIONAL, nrOfMessages [3] IMPLICIT NrOfMessages OPTIONAL, originatingNr [4] PartyNumber OPTIONAL, timestamp TimeStamp OPTIONAL, priority [5] IMPLICIT INTEGER (0..9) OPTIONAL, argumentExt CHOICE { extension [6] IMPLICIT Extension{{MCMEExtSet}}, multipleExtension [7] IMPLICIT SEQUENCE OF Extension{{MCMEExtSet}} } OPTIONAL }