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Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 4: Protocol testing specification for Direct Mode Operation (DMO); Sub-part 8: Test Suite Structure and Test Purposes (TSS&TP) for Direct Mode Gateway (DM-GATE)

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Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the Terrestrial Trunked Radio (TETRA) Project of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

This ETS consists of 4 parts as follows:

Part 1: "Radio";

Part 2: "Protocol testing specification for Voice plus Data (V+D)";

Part 4: "Protocol testing specification for Direct Mode Operation (DMO)";

Part 5: "Security".

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This ETS contains the Test Specifications: Test Suite Structure and Test Purposes (TSS & TPs) and the Abstract Test Suites (ATSs) to test conformity of products to the TETRA Direct Mode Operation (DMO) protocols. This ETS is divided into several parts, each one dealing with one TSS & TP or one ATS for the test of a layer 2 or layer 3 protocol for DMO.

This present sub-part 8 deals with TSS & TP for a GateWay (GW) connecting the MS-GW to the Switching and Management Infrastructure (SwMI) of a V+D system.

NOTE: Sub-part 7 deals with TSS & TP for the other part of the DMO Gateway, which is a Mobile Station (MS) connected to a Gateway (MS-GW).

Testing of security features is outside the scope of this ETS.

The objective of this test specification is to provide a basis for approval tests for TETRA equipment giving a high probability of air interface inter-operability between different manufacturer's TETRA equipment.

The ISO standard for the methodology of conformance testing, ISO/IEC 9646-1 [6] and ISO/IEC 9646-2 [7], as well as the ETSI methodology for conformance testing, ETS 300 406 [8], are used as the basis for the test methodology.

2 References

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] Void.

[2] ETS 300 396-5: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 5: Gateways".

[3] ETS 300 396-8-3: "Terrestrial Trunked Radio (TETRA); Direct Mode Operation (DMO); Part 8: PICS proforma; Sub-part 3: Direct Mode Gateway (DM-GATE)".

[4] ETS 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

[5] ETS 300 394-2-1: "Terrestrial Trunked Radio (TETRA); Conformance testing specification; Part 2: Protocol testing specification for Voice plus Data (V+D); Sub-part 1: Test suite structure and test purposes".

[6] ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance Testing Methodology and Framework; Part 1: General Concepts". (See also CCITT Recommendation X.290).

[7] ISO/IEC 9646-2 (1994): "Information technology; Open Systems Interconnection; Conformance Testing Methodology and Framework; Part 2: Abstract Test Suite Specification". (See also CCITT Recommendation X.291).

[8] ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

3 Definitions and abbreviations

3.1 TETRA definitions

For the purposes of this ETS, the definitions given in ETS 300 396-5 [2] apply.

3.2 TETRA abbreviations

For the purposes of this ETS the following TETRA abbreviations apply:

CM	Circuit Mode
DMCC	Direct Mode Call Control
DMO	Direct Mode of Operation
GCC	Gateway Call Control
GMM	Gateway Mobility Management
GW	Gateway
LLC	Logical Link Control
MAC	Medium Access Control
MLE	Mobile Link entity
MNI	Mobile Network Identity
MS	Mobile Station
MSC	Message Sequence Chart
NWK	NetWorK. Layer 3 of the TETRA protocol stack
SDS	Short Data Services
TX	Transmit
RX	Receive

3.3 ISO 9646 definitions

For the purposes of this ETS the following ISO 9646-1 [6] definitions apply:

Implementation Conformance Statement (ICS)
Implementation Under Test (IUT)
Implementation eXtra Information for Testing (IXIT)
Protocol Implementation Conformance Statement (PICS)
Protocol Implementation eXtra Information for Testing (PIXIT)

3.4 ISO 9646 abbreviations

For the purposes of this ETS the following ISO 9646-1 [6] abbreviations apply:

IUT	Implementation Under Test
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

This TSS contains several components, some are specific of the gateway functionality and are new, while others are derived or form a subset of other TETRA specifications. TPs are either included in the present document, or are referenced into another document.

Here is the list of the TSS components:

- at layer 3 also named NTW layer:
  - Gateway Call Control (GCC):
    - CM: derived from V+D CMCE TPs in ETS 300 394-2-1 [5];
    - SDS: derived from V+D CMCE TPs in ETS 300 394-2-1 [5].
  - Gateway Mobility Management (GMM): derived from V+D MM TPs in ETS 300 394-2-1 [5];
  - Mobile Link Entity (MLE): subset of V+D MLE in ETS 300 394-2-1 [5].

at layer 2:
- LLC: subset of V+D LLC in ETS 300 394-2-1 [5];
- MAC: subset of V+D MLE in ETS 300 394-2-1 [5].

4.1 NWK layer or Layer 3 test groups

The first level separates the NWK layer (or layer 3) in different protocols (Circuit mode, Short Data Service). Next level splits protocol testing into functional test groups according to the type of testing: Capability test (CA), Valid Behaviour (BV) and Timer tests (TI). Further level classifies the possible operations in each protocol condition or state.

The following list defines the NWK layer test group names and identifiers used for those:

Gateway (DMO_GATE):
- Gateway Call Control (GWCC):
  - Circuit mode (CM):
    - Call set-up (SU);
    - Call disconnection (CD);
    - Call collision (CC);
    - Control of Transmission (CT);
    - Timer Tests (TI);
    - Short Data Service (SDS).
- Gateway Mobility Management (GWMM):
  - Capability tests (CA);
  - Valid Behaviour tests (BV).
- Mobile link entity (MLE): derived from V+D MS MLE.

4.2 Layer 2 test groups

The first level of the Layer 2 test groups separates the test suite in functional test groups: CA, BV and TI. The second level of the test subgroups is used to form a division of protocol requirements.

In the case of a Gateway, the layer 2 contains the LLC and the MAC, and the TSS as well as the TPs of both protocols are derived from the V+D identical components. See ETS 300 394-2-1 [5].

4.3 Test group description

Capability (CA) tests provide limited testing that the observable capabilities of the IUT are in accordance with the conformance requirements and the additional capabilities claimed in the PICS/PIXIT.

The Valid Behaviour (BV) group tests an IUT in response to valid behaviour of the test system. "Valid" means that a test event is syntactically and contextually correct. All test cases in the valid behaviour group are intended to verify as thoroughly as possible the various functions of the protocol.

Different timers are defined to supervise the various state transitions. The Timer (TI) test group is intended to verify that the IUT is reacting properly to an expiry of one of the timers or to a counter mismatch.

5 Introduction to Test Purposes (TPs)

The test purposes for each test suite are defined in clause 6 of the present document for NWK layer and MAC layer.

5.1 Test purpose definition conventions

5.1.1 Text and MSCs

Each TP is described in a table that contains the following information:

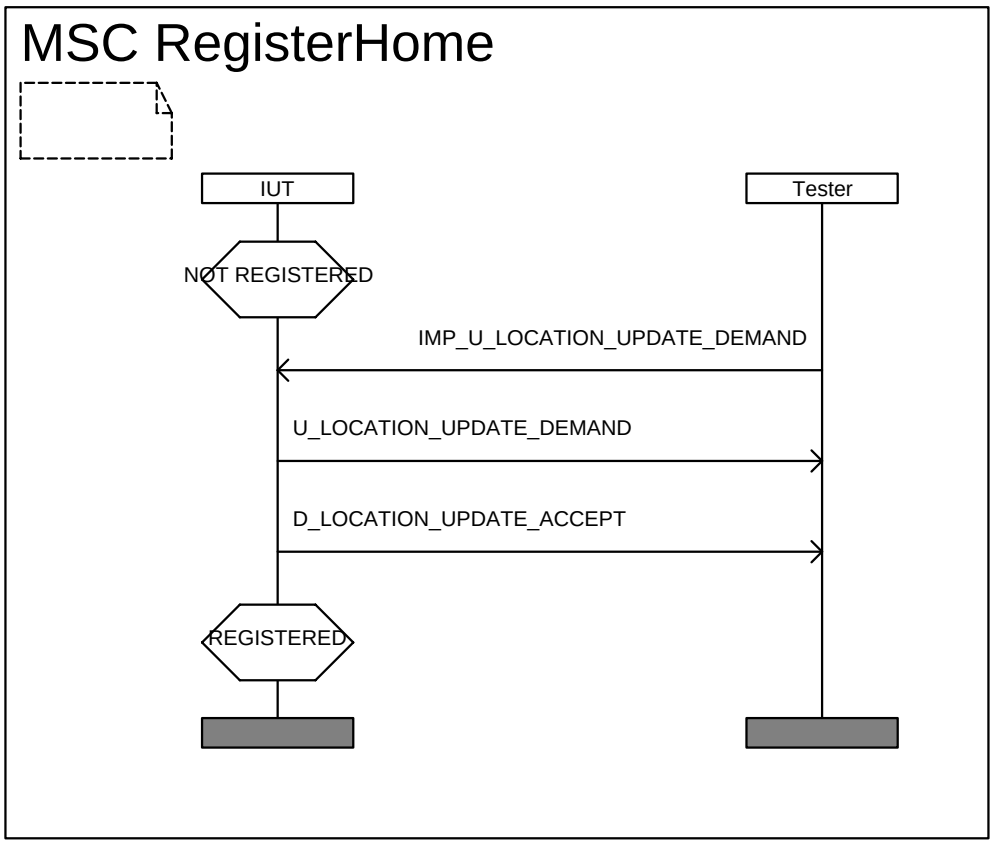
TP-Name The TP name is a unique identifier, specified according to the TP naming conventions defined in the subclause below. (it is also the name of the corresponding test case)	**Reference**: reference to the paragraph number of specification ETS 300 396-5 [2] stating this conformance requirement. For example: ETS 300 396-5 [2], 6.2.5.1
Purpose	purpose of the test itself, indicating for example the test performed against a requirement of the protocol, described by this test purpose. Example: test of changeover initiated from RX reservation state
Test description	body of the test
Pass criteria	visible action to be observed at PCO to declare that the IUT passes the test and conforms to the specifications
Selection	expression based on ETS 300 396-8-3 [3] PICS statements, used to select or deselect the corresponding test case according to the options of the implementation.
Preamble	"None" or name of the preamble procedure bringing the IUT from idle state to the state required to run the test. For example: idle_to_RX_reservation
Postamble	"None" or name of the postamble to bring the IUT back to idle state, for example: RX_occupation_to_idle.

The preambles and postambles are described using MSCs and are shown in the following paragraphs.

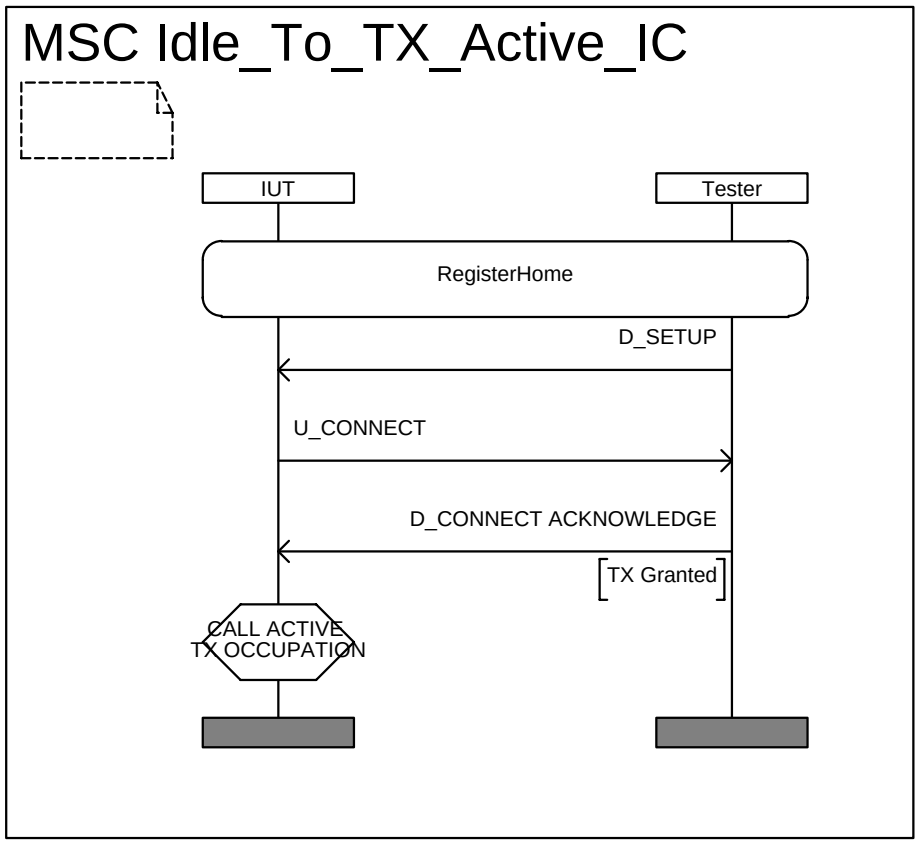
5.1.2 Preamble descriptions

Preambles are used to bring the IUT from the idle state to the state where the test takes place. As the protocol has different options, as for instance the use of presence check or the absence of presence check, there are several ways to reach a given state. The preamble has to be chosen according to the IUT capabilities and the implemented options.

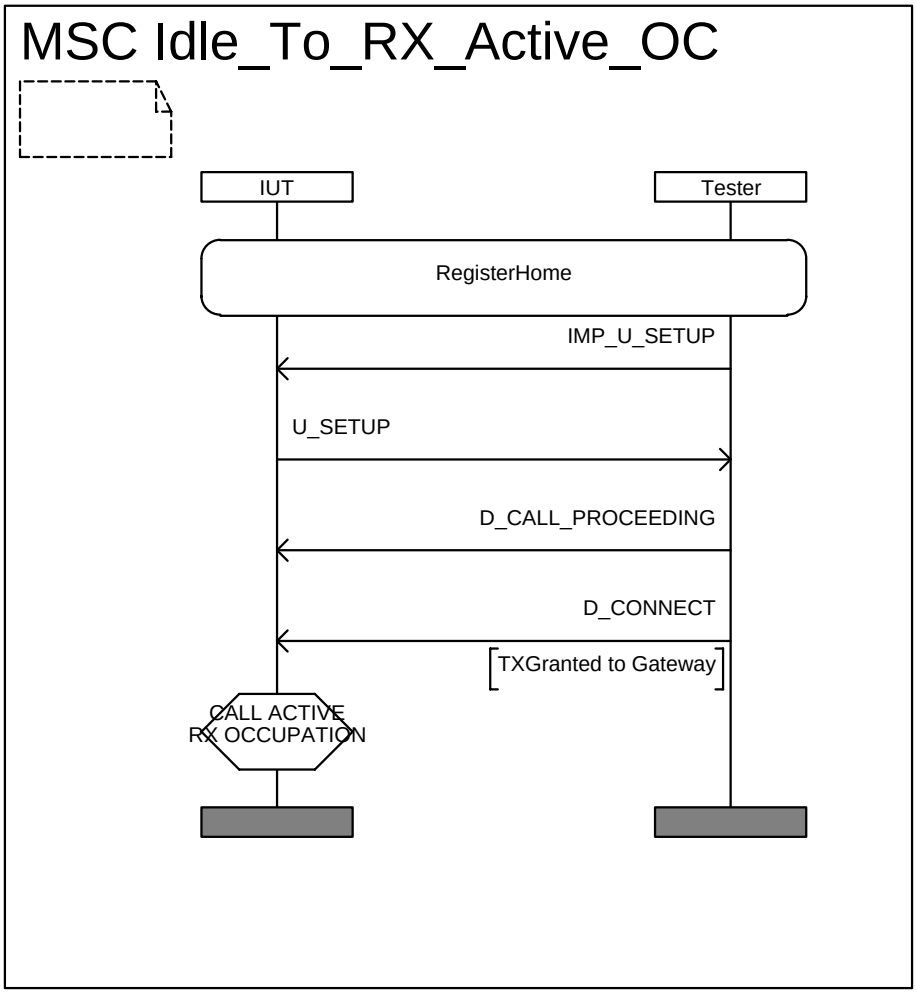
5.1.2.1 Preamble RegisterHome



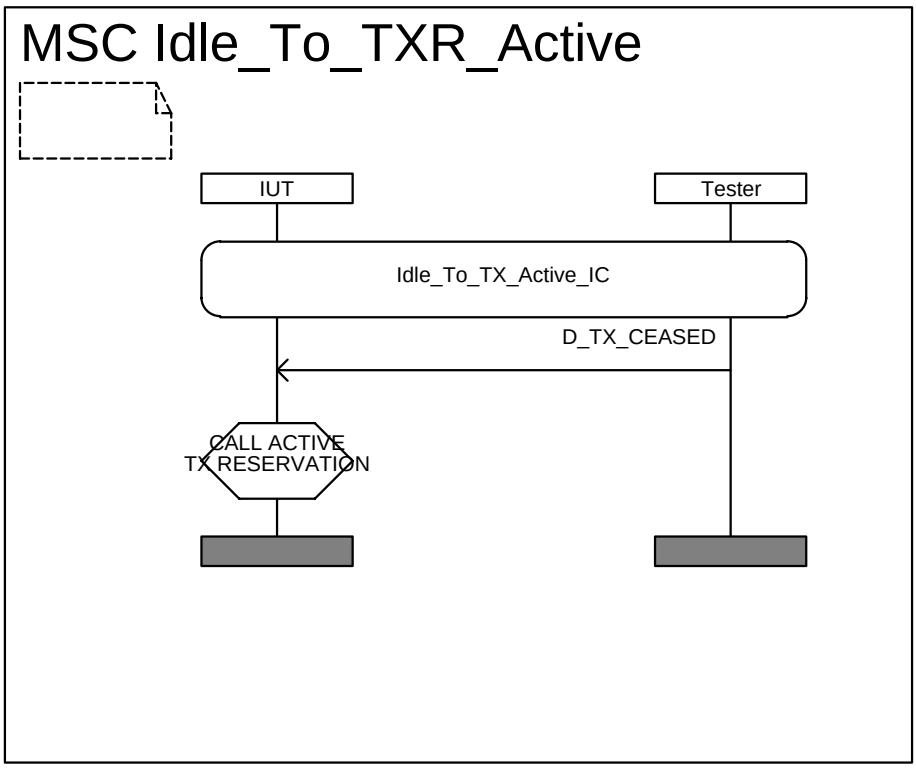
5.1.2.2 Preamble Idle_To_TX_Active_IC: From Idle state to Call Active TX Occupation



5.1.2.3 Preamble Idle_To_RX_Active: From Idle state to Call Active RX Occupation



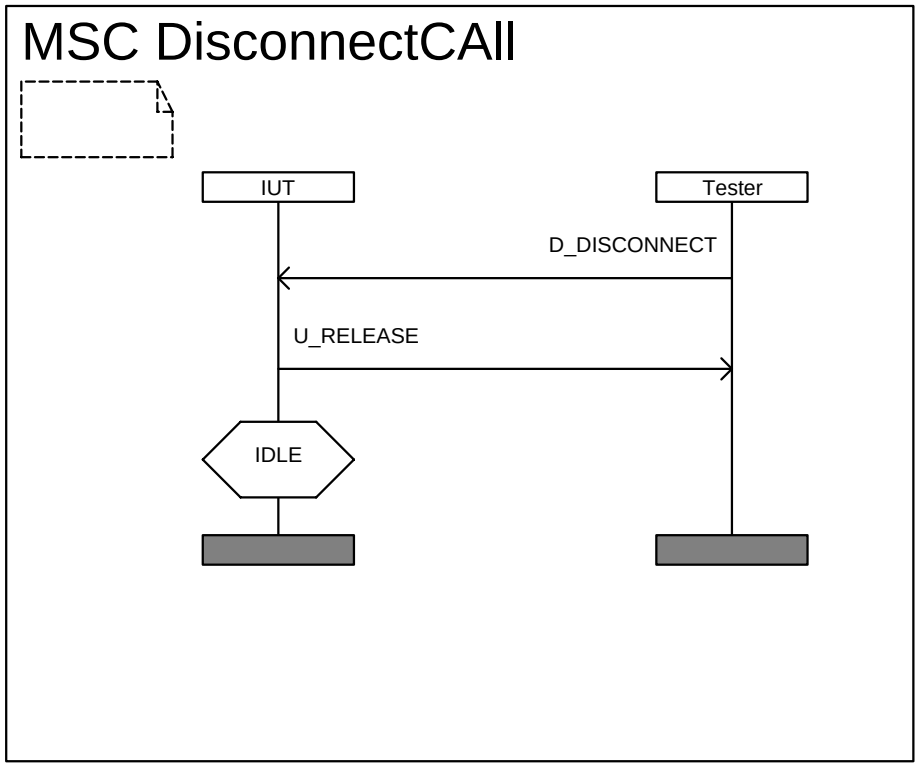
5.1.2.4 Preamble Idle_to_TXR_Active



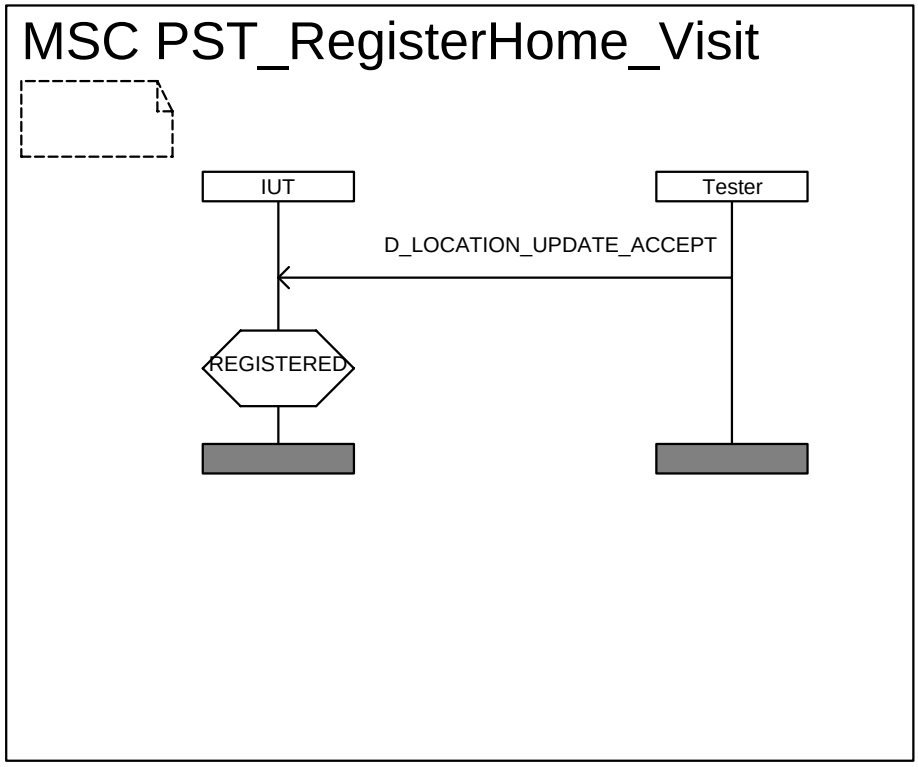
5.1.3 Postamble descriptions

Postambles are used to bring the IUT from the state ending the test, to the idle state.

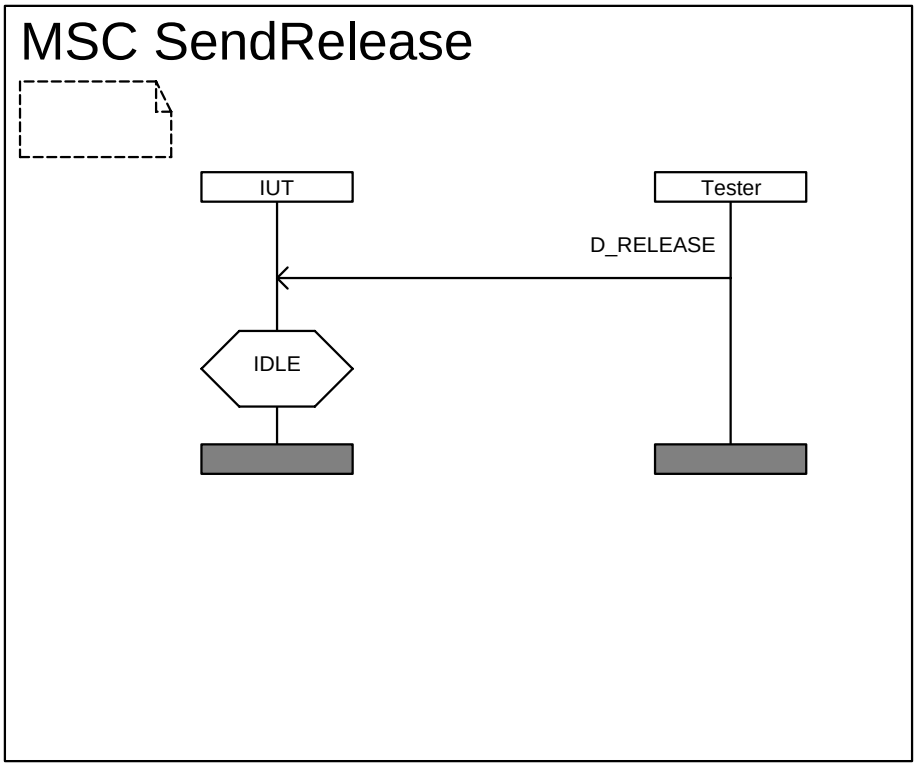
5.1.3.1 Postamble DisconnectCall: From Call Active to Idle



5.1.3.2 Postamble PST_RegisterHome_Visit: end registration procedure



5.1.3.3 Postamble SendRelease



5.2 Test purpose naming conventions

The identifier of the test purpose is built according to table 1.

Table 1: Test purpose naming convention

DMO/<ts>/<fm>/<ss>/<tt>/<uu>/<nn>		
<ts> = test suite type	MSMS MSGW GATE REPx	MS to MS (see ETS 300 394-4-1 []) MS connected to a gateway Gateway Repeater type x (see ETS 300 394-4-4 [])
<fm> = functional entity in a layer	DMCC MAC	Direct Mode Call Control (layer 3) Upper MAC (layer 2)
<ss> = test group	letters such as: CM SDS	abbreviation of the group name (optional) Circuit Mode (layer 3) Short Data Service (layer 3)
tt = Type of testing	CA BV BI TI	Capability Tests Valid Behaviour Tests Invalid Behaviour Tests Timer expiry and counter mismatch tests
<uu> = test subgroup	letters	abbreviation of the subgroup name (optional)
<nn> = sequential number	01-99	Test Purpose Number

6 Test Purposes for the Call Control protocol of a DMO GATEWAY: GWCC

In this section, the IUT is a gateway. The tester is a SwMI of a V+D network. The interface between the gateway and the SwMI is being tested.

6.1 Circuit Mode (CM) Call Control test purposes

6.1.1 Call set up

DMO_GATE_GWCC_CM_BV_SU_01	**Reference:** ETS 300 396-5 [2], 9.3.2.1, case iii)
Purpose	Individual outgoing call set-up, TX granted to Gateway
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it by sending the D-CALL PROCEEDING then D-CONNECT PDU with TX granted to Gateway.
Pass criteria	Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU).
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_02	**Reference:** ETS 300 396-5 [2], 9.3.2.1, case i)
Purpose	Individual outgoing call set-up, TX granted to called
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it by sending the D-CALL PROCEEDING then D-CONNECT PDU with TX granted to called.
Pass criteria	Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU)
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_03	**Reference:** ETS 300 396-5 [2], 9.3.2.1, case ii)
Purpose	Individual outgoing call set-up, TX granted to no party
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it by sending the D-CALL PROCEEDING then D-CONNECT PDU with TX granted to no party.
Pass criteria	Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU)
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_04	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, TX granted to V+D (calling)
Test description	The tester issues D-SETUP PDU.
Pass criteria 1	Check that the IUT accepts it by sending the U-CONNECT PDU.
Test description	The tester issues D-CONNECT ACKNOWLEDGE PDU with TX granted to V+D.
Pass criteria 2	Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU)
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_05	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, TX granted to called DM MS
Test description	The tester issues D-SETUP PDU. Check that the IUT accepts it by sending the U-CONNECT PDU. The tester issues D-CONNECT ACKNOWLEDGE PDU with TX granted to called DM-MS.
Pass criteria	Check that the IUT sends back U-TX-CEASED. Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_06	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, TX granted to no party
Test description	The tester issues D-SETUP PDU. Check that the IUT accepts it by sending the U-CONNECT PDU. The tester issues D-CONNECT ACKNOWLEDGE PDU with TX granted to no party.
Pass criteria	Check that the IUT reaches the CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_07	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, on/off hook signalling
Test description	The tester issues D-SETUP PDU, containing on/off hook signalling request
Pass criteria	Check that the IUT sends back to the tester a U-CONNECT PDU with hook method selection element value set to 'no hook signalling'
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_08	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, duplex call
Test description	The tester issues D-SETUP PDU, containing duplex call support request
Pass criteria	Check that the IUT sends back to the tester a U-CONNECT PDU with simplex/duplex selection element value set to 'simplex requested'
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_09	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Individual incoming call set-up, slot service
Test description	The tester issues D-SETUP PDU, containing multi-slot support request
Pass criteria	Check that the IUT sends back to the tester a U-CONNECT PDU with slots per frame element value set to 'one slot'
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_10	**Reference:** ETS 300 396-5 [2], 9.3.2.1, case ii)
Purpose	Outgoing call set-up (without D-CALL PROCEEDING PDU), TX granted to no party
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it by sending the D-CONNECT PDU with TX granted to no party sent back by the tester. (the tester does not send the D-CALL PPROCEEDING PDU.
Pass criteria	Check that the IUT reaches CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU)
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	RegisterHome
Postamble	DisconnectCall

DMO_GATE_GWCC_CM_BV_SU_11	**Reference:** ETS 300 396-5 [2], 9.3.1.2
Purpose	Incoming group call set-up, TX granted to V+D (calling)
Test description	The tester issues D-SETUP PDU to the IUT
Pass criteria	Check that the IUT reaches CALL ACTIVE state. To do it, the tester sends D-DISCONNECT PDU to the IUT, which answers with U-RELEASE PDU)
Selection ETS 300 396-8-3 [3]	A.40/1 Group call from V+D without presence check
Preamble	RegisterHome
Postamble	DisconnectCall

6.1.2 Call disconnection

DMO_GATE_GWCC_CM_BV_CD_01	**Reference:** ETS 300 396-5 [2], 9.3.3.9.1
Purpose	Check disconnection initiated by DM-MS
Test description	The tester issues an implicit send to cause the IUT to disconnect. The IUT sends U-DISCONNECT PDU to the tester, which sends back the D-RELEASE.
Pass criteria	Check that the IUT reaches Idle state. To do it, check that the IUT accepts a call with the same call identifier
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	Idle_To_RX_Active_OC
Postamble	none

DMO_GATE_GWCC_CM_BV_CD_02	**Reference:** ETS 300 396-5 [2], 9.3.3.9.2
Purpose	Check disconnection initiated by the SwMI
Test description	The tester issues D-DISCONNECT PDU to the IUT.
Pass criteria	Check that the IUT accepts it (U-RELEASE PDU sent back to the tester) then enters IDLE state
Selection ETS 300 396-8-3 [3]	A.38/1 Accept circuit mode call
Preamble	Idle_To_Active
Postamble	none

DMO_GATE_GWCC_CM_BV_CD_03	**Reference:** ETS 300 396-5 [2], 9.3.3.9.2
Purpose	Check release initiated by Network
Test description	The tester issues D-RELEASE PDU to the IUT.
Pass criteria	Check that the IUT reaches Idle state. To do it, check that the IUT accepts a call with the same call identifier
Selection ETS 300 396-8-3 [3]	A.38/1 Accept circuit mode call
Preamble	Idle_To_Active
Postamble	none

6.1.3 Call collision

DMO_GATE_GWCC_CM_BV_CC_01	**Reference:** ETS 300 396-5 [2], 9.3.2.2
Purpose	Individual call collision
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, while the tester sends a D-SETUP (new call identifier)
Pass criteria	Check that the IUT gives priority to one of the calls, i.e. it will release one of the two calls and keep the other by sending a U-DISCONNECT with the relevant call identifier.
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check AND A.41/2 Individual call from DM without presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_CC_02	**Reference:** ETS 300 396-5 [2], 9.3.2.2
Purpose	Group call collision
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, while the tester sends a D-SETUP (new call identifier)
Pass criteria	Check that the IUT gives priority to one of the calls, i.e. it will release one of the two calls and keep the other by sending a U-DISCONNECT with the relevant call identifier.
Selection ETS 300 396-8-3 [3]	A.40/1 Group call from V+D without presence check AND A.40/2 Group call from DM without presence check
Preamble	RegisterHome
Postamble	none

6.1.4 Control of transmission

DMO_GATE_GWCC_CM_BV_CT_01	**Reference:** ETS 300 396-5 [2], 9.3.3.1.1
Purpose	end of transmission from DM-MS, or pre-emption from Gate for ongoing call
Test description	The tester issues an implicit send to cause the IUT to initiate end of transmission. The IUT sends U-TX-CEASED PDU to the tester
Pass criteria	Check that the IUT accepts in response D-TX-CEASED PDU and stops transmitting
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	Idle_To_RX_Active_OC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_02	**Reference:** ETS 300 396-5 [2], 9.3.3.1.2
Purpose	end of transmission from V+D
Test description	The tester issues D-TX-CEASED PDU to the IUT
Pass criteria	Check that the IUT accepts it and stops transmitting
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	Idle_To_RX_Active_OC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_03	**Reference:** ETS 300 396-5 [2], 9.3.3.3
Purpose	TX granted to another party
Test description	The tester sends D-TX-GRANTED PDU to the IUT
Pass criteria	Check that the IUT accepts it and restarts transmission
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TXR_Active
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_04	**Reference:** ETS 300 396-5 [2], 9.3.3.2
Purpose	Transmission interruption during channel occupation (gateway master)
Test description	The tester sends the D-TX-INTERRUPT PDU to the IUT
Pass criteria	Check that the IUT accepts it and stops transmitting if TX assigned to "no party"
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TX_Active_IC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_05	**Reference:** ETS 300 396-5 [2], 9.3.3.4.1
Purpose	demand for transmission from DM-MS
Test description	The tester issues an implicit send to cause the IUT to initiate a demand for transmission. The IUT sends U-TX-DEMAND PDU to the tester
Pass criteria	Check that the IUT accepts in response D-TX-GRANTED PDU and restarts transmitting
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TXR_Active
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_06	**Reference:** ETS 300 396-5 [2], 9.3.3.5
Purpose	V+D permission to transmit withdrawn
Test description	The tester sends a D-TX WAIT PDU
Pass criteria	Check that the IUT stops transmitting
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TX_Active_IC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_07	**Reference:** ETS 300 396-5 [2], 9.3.3.6
Purpose	V+D permission to continue with withdrawn call
Test description	The tester issues a D-TX WAIT PDU, the IUT stops transmitting. The tester sends D-TX CONTINUE PDU indicating same transmission permission
Pass criteria	Check that the IUT starts transmitting again
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TX_Active_IC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_08	**Reference:** ETS 300 396-5 [2], 9.3.4.1.3
Purpose	DM-MS initiates pre-emption for ongoing call during channel occupation
Test description	The tester issues an implicit send to cause the IUT to initiate a pre-emption. The IUT sends U-TX-DEMAND PDU to the tester
Pass criteria	Check that the IUT accepts in response D-TX-GRANTED PDU and starts to transmit
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	Idle_To_TX_Active_IC
Postamble	DiconnectCall

DMO_GATE_GWCC_CM_BV_CT_09	**Reference:** ETS 300 396-5 [2], 9.3.4.2.1
Purpose	V+D initiates pre-emption during channel occupation (gateway slave)
Test description	The tester sends a D-TX-INTERRUPT with granted permission assigned to another user to the IUT
Pass criteria	Check that the IUT accepts it and starts to transmit if TX granted to another user
Selection ETS 300 396-8-3 [3]	A.39/4 Accept Call from DM without presence check
Preamble	Idle_To_RX_Active_OC
Postamble	DiconnectCall

6.1.5 Timer tests

DMO_GATE_GWCC_CM_BV_TI_01	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Check T301 time out.
Test description	The tester sends D-SETUP PDU to the IUT. The IUT accepts it by sending the U-CONNECT PDU. T301 is started. The tester does not send the D-CONNECT ACKNOWLEDGE PDU.
Pass criteria	When T301 expires, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer".
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_TI_02	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Check T310 time out
Test description	The tester sends D-SETUP PDU to the IUT. The IUT accepts it (U-CONNECT PDU sent back to the tester). The tester issues D-CONNECT ACKNOWLEDGE PDU. T310 is started
Pass criteria	When T310 expires, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer"
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_TI_03	**Reference:** ETS 300 396-5 [2], 9.3.1.1
Purpose	Check DT361 time out
Test description	The tester sends D-SETUP PDU to the IUT. DT361 is started. The DM-MS or its simulation does not answer to the DM-SETUP-PRES PDU
Pass criteria	When DT361 expires and after DN361 times, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer"
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_TI_04	**Reference:** ETS 300 396-5 [2], 9.3.2.1
Purpose	Check T303 time out
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester. T303 is started. But tester does not send D-CALL PROCEEDING nor D-CONNECT PDU
Pass criteria	When T303 expires, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer"
Selection ETS 300 396-8-3 [3]	A.40/2 Group call from DM without presence check or A.41/2 Individual call from DM without presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_TI_05	**Reference:** ETS 300 396-5 [2], 9.3.2.1
Purpose	Check T302 time out
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it (D-CALL PROCEEDING PDU sent back by the tester). T302 is started. But tester does not send D-CONNECT PDU
Pass criteria	When T302 expires, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer"
Selection ETS 300 396-8-3 [3]	A.40/2 Group call from DM without presence check or A.41/2 Individual call from DM without presence check
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_CM_BV_TI_06	**Reference:** ETS 300 396-5 [2], 9.3.2.1
Purpose	Check DT363 time out
Test description	The tester issues an implicit send to cause the IUT to initiate a call set-up. The IUT sends U-SETUP PDU to the tester, which accepts it (D-CALL PROCEEDING PDU sent back by the tester). Then tester sends D-CONNECT PDU. DT363 is started
Pass criteria	When DT363 expires, check that the IUT sends U-DISCONNECT PDU to the tester with value "expiry of timer"
Selection ETS 300 396-8-3 [3]	A.40/2 Group call from DM without presence check or A.41/2 Individual call from DM without presence check
Preamble	RegisterHome
Postamble	none

6.2 Short Data Service (SDS) test purposes

Incoming messages

DMO_GATE_GWCC_SDS_BV_01	**Reference:** ETS 300 396-5 [2], 9.4.1.1, 9.4.1.2
Purpose	Incoming SDS from V+D, leading to unacknowledged or acknowledged SDS, pre-defined short data message
Test description	The tester issues a D-STATUS PDU (group or individual address)
Pass criteria	Check that the IUT accepts it
Selection ETS 300 396-8-3 [3]	A.43/1 Accept incoming SDS from V+D
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_SDS_BV_02	**Reference:** ETS 300 396-5 [2], 9.4.1.1, 9.4.1.2
Purpose	Incoming SDS from V+D, leading to unacknowledged or acknowledged SDS, user defined short data message
Test description	The tester issues a D-SDS-DATA PDU (group or individual address)
Pass criteria	Check that the IUT accepts it
Selection ETS 300 396-8-3 [3]	A.43/1 Accept incoming SDS from V+D
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_SDS_BV_03	**Reference:** ETS 300 396-5 [2], 9.4.2.1
Purpose	Outgoing SDS to V+D, pre-defined short data message
Test description	The tester issues an implicit send to cause the IUT to initiate a pre-defined short data message
Pass criteria	Check that the IUT sends a U-STATUS PDU (group or individual address)
Selection ETS 300 396-8-3 [3]	A.43/2 Accept outgoing SDS from DM
Preamble	RegisterHome
Postamble	none

DMO_GATE_GWCC_SDS_BV_04	**Reference:** ETS 300 396-5 [2], 9.4.2.1
Purpose	Outgoing SDS to V+D, user defined short data message
Test description	The tester issues an implicit send to cause the IUT to initiate a user defined short data message
Pass criteria	Check that the IUT sends a U-SDS-DATA PDU (group or individual address)
Selection ETS 300 396-8-3 [3]	A.43/2 Accept outgoing SDS from DM
Preamble	RegisterHome
Postamble	none

7 Test Purposes for the MM protocol of a DMO GATEWAY

In this section, the IUT is a gateway. The tester is a SwMI of a V+D network. The interface between the gateway and the SwMI is being tested.

These test purposes are a subset and are derived from the V+D MM test purposes, ETS 300 394-2-1 [5]

7.1 Capability test purposes

DMO_GATE_GWMM_CA_01	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.3.1.1
Purpose	Incoming call set-up when no registration required
Test description	The IUT is powered on and no registration is required. The tester issues D-SETUP PDU to the IUT
Pass criteria	Check that the IUT accepts it (U-CONNECT PDU sent back to the tester).
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	none
Postamble	SendRelease

DMO_GATE_GWMM_CA_02	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.1, 16.4.1.1
Purpose	MM initiates registration
Test description	The IUT is powered on and registration is required.
Pass criteria	Check that the IUT initiates registration by sending U-LOCATION UPDATE DEMAND PDU
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	none
Postamble	PST_RegisterHome_Visit

DMO_GATE_GWMM_CA_03	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.2
Purpose	Incoming call set-up after required registration
Test description	The IUT is powered on and registration is required. The IUT initiates registration by sending U-LOCATION UPDATE DEMAND PDU. The tester respond with U-LOCATION UPDATE ACCEPT PDU. The tester issues D-SETUP PDU to the IUT
Pass criteria	Check that the IUT accepts it (U-CONNECT PDU sent back to the tester).
Selection ETS 300 396-8-3 [3]	A.41/1 Individual call from V+D with presence check
Preamble	none
Postamble	SendRelease

7.2 Valid behaviour test purposes

7.2.1 MSGW initiated registration procedures

DMO_GATE_GWMM_BV_01	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.2 b)
Purpose	Check U-LOCATION UPDATE DEMAND PDU parameters
Test description	MLE initiates registration procedure. The IUT initiates registration by sending U-LOCATION UPDATE DEMAND PDU
Pass criteria	Check that the U-LOCATION UPDATE DEMAND PDU has 'location update type' set to 'ITSI attach' 'class of MS' set to 'gateway operation'
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	none
Postamble	PST_RegisterHome_Visit

DMO_GATE_GWMM_BV_02	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.1.1 b)
Purpose	Check U-LOCATION UPDATE DEMAND PDU parameters, when MNI is different from currently active registration area and not equal to IUT home network MNI.
Test description	MLE initiates registration procedure, with MNI different from currently active registration area. The IUT initiates registration by sending U-LOCATION UPDATE DEMAND PDU
Pass criteria	Check that the IUT sends U-LOCATION UPDATE DEMAND PDU in which the "location update type" element is set to "migrating location updating".
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	RegisterHome
Postamble	PST_RegisterHome_Visit

DMO_GATE_GWMM_BV_03	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.2 c)
Purpose	Check U-LOCATION UPDATE DEMAND PDU parameters, during registration procedures with new un-exchanged ITSI.
Test description	IUT initiates registration procedure with un-exchanged ITSI. The IUT sends a U-LOCATION UPDATE DEMAND PDU in which "location update type" element is set to "ITSI attach". The tester sends the D-LOCATION UPDATE PROCEEDING PDU.
Pass criteria	Check that IUT responds with a U-LOCATION UPDATE DEMAND PDU in which "location update type" element is set to "demand location updating".
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	RegisterHome
Postamble	PST_RegisterHome_Visit

7.2.2 V+D initiated registration procedures

DMO_GATE_GWMM_BV_04	**Reference:** ETS 300 396-5 [2], 10.3.1 ETS 300 392-2 [4], 16.4.3
Purpose	Check U-LOCATION UPDATE DEMAND PDU when having received the D-LOCATION UPDATE COMMAND PDU.
Test description	The tester sends the D-LOCATION UPDATE COMMAND PDU.
Pass criteria	Check that the IUT sends back U-LOCATION UPDATE DEMAND PDU in which the "location update type" element is set to "demand location updating".
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	RegisterHome
Postamble	PST_RegisterHome_Visit

7.2.3 Forwarding DM-MS registration procedures to SwMI

DMO_GATE_GWMM_BV_05	**Reference:** ETS 300 396-5 [2], 10.3.4
Purpose	Forwarding DM-MS registration or de-registration.
Test description	The tester issues an implicit send to make the IUT forward DM-MS identities to SwMI.
Pass criteria	Verify that, to forward the identities of DM-MS whose registration has been accepted to the SwMI, the IUT send a U-ATTACH/DETACH DM-MS IDENTITY PDU.
Selection ETS 300 396-8-3 [3]	A.37/2 Gateway MM
Preamble	RegisterHome
Postamble	none

8 Test Purposes for the MLE protocol of a DMO GATEWAY

In this section, the IUT is a gateway. The tester is a SwMI of a V+D network. The interface between the gateway and the SwMI is being tested.

The test purposes presented in ETS 300 394-2-1 [5], clause 6 shall apply.

9 Test Purposes for the LLC protocol of a DMO GATEWAY

In this section, the IUT is a gateway. The tester is a SwMI of a V+D network. The interface between the gateway and the SWMI is being tested.

The test purposes presented in ETS 300 394-2-1 [5], clause 7 shall apply.

10 Test Purposes for the MAC protocol of a DMO GATEWAY

In this section, the IUT is a gateway. The tester is a SWMI of a V+D network. The interface between the gateway and the SWMI is being tested.

The test purposes presented in ETS 300 394-2-1 [5], clause 8 shall apply.

Annex A (informative): Bibliography

- ETS 300 396-1: "Terrestrial Trunked Radio (TETRA); Technical requirements for Direct Mode Operation (DMO); Part 1: General network design".

History

Document history			
November 1998	Public Enquiry	PE 9911:	1998-11-13 to 1999-03-12
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