



**SLOVENSKI STANDARD**  
**SIST ETS 300 394-2-1:1999**

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**Prizemni snopovni radio (TETRA) - Specifikacija za preskušanje skladnosti - 2. del:  
Specifikacija preskušalnega protokola za govor in podatke (V+D) -1. poglavje:  
Zgradba preskušalnega niza (TSS) in nameni preskušanja (TP)**

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

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33.070.10	Prizemni snopovni radio (TETRA)	Terrestrial Trunked Radio (TETRA)
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Sub-part 1: Test suite structure and test purposes**

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Terrestrial Trunked Radio (TETRA) Project of the European Telecommunications Standards Institute (ETSI).

Every ETS prepared by ETSI is a voluntary standard. This ETS contains text concerning conformance testing of the equipment to which it relates. This text should be considered only as guidance and does not make this ETS mandatory.

This ETS will consist of two parts with various sub-parts:

Part 1: "Radio";

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

Transposition dates	
Date of adoption of this ETS:	6 February 1998
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Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 November 1998
Date of withdrawal of any conflicting National Standard (dow):	30 November 1998

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## 1 Scope

This European Telecommunication Standard (ETS) contains the Test Suite Structure (TSS) and Test Purposes (TPs) to test the TETRA Voice plus Data (V+D) protocols.

The conformance testing of Connection Oriented Network Protocol (CONP) is outside the scope of this ETS. Instead, existing test specifications for that protocol should be applied.

The testing of supplementary services is outside the scope of this ETS.

The TPs presented in this ETS are applicable to TETRA MSs supporting optional security as specified in ETS 300 392-7 [3], taking into account the restrictions described in more detail further on in this ETS. However, the actual 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 [4] and ISO/IEC 9646-2 [5], as well as the ETSI methodology for conformance testing, ETS 300 406 [6], are used as the basis for the test methodology.

## 2 Normative 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] ETS 300 392-1: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA) system; Voice plus Data (V+D); Part 1: General Network Design"  
<https://standards.iteh.ai/catalog/standards/sist/7f6849eb-3197-4d61-ad8c-3094e7765d/sist-ets-300-394-2-1-1999>
- [2] ETS 300 392-2: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA) system; Voice plus Data (V+D); Part 2: Air Interface".
- [3] ETS 300 392-7: "Radio Equipment and Systems (RES); Trans-European Trunked Radio (TETRA) system; Voice plus Data (V+D); Part 7: Security".
- [4] ISO/IEC 9646-1 (1991): "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 1: General Concepts" (see also CCITT Recommendation X.290 (1991)).
- [5] ISO/IEC 9646-2 (1991): "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 2: Abstract Test Suite Specification" (see also CCITT Recommendation X.291 (1991)).
- [6] 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 300 392-2 [2] apply.

#### 3.2 TETRA abbreviations

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

CMCE	Circuit Mode Control Entity
CONP	Connection Oriented Network Protocol
FCS	Frame Check Sequence
ITSI	Individual TETRA Subscriber Identity
LACC	Location Area Country Code
LANC	Location Area Network Code
LLC	Logical Link Control
MAC	Medium Access Control
MCC	Mobile Country Code
MLE	Mobile Link Entity
MM	Mobility Management
MNC	Mobile Network Code
MS	Mobile Station
NWK	Network. Layer 3 of the TETRA protocol stack
SCLNP	Specific Connectionless Network Protocol
SDS	Short Data Services sub entity within CMCE
SDU	Service Data Unit
SwMI	Switching and Management Infrastructure

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#### 3.3 ISO 9646 definitions

For the purposes of this ETS, the following ISO 9646-1 [4] 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 [4] 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)

### 4.1 Network (NWK) layer

#### 4.1.1 Network (NWK) layer TSS overview

The NWK layer test suite, as illustrated in figure 1, is structured as a tree with a first level defined as NWK representing the whole test suite for TETRA V+D network layer protocols.

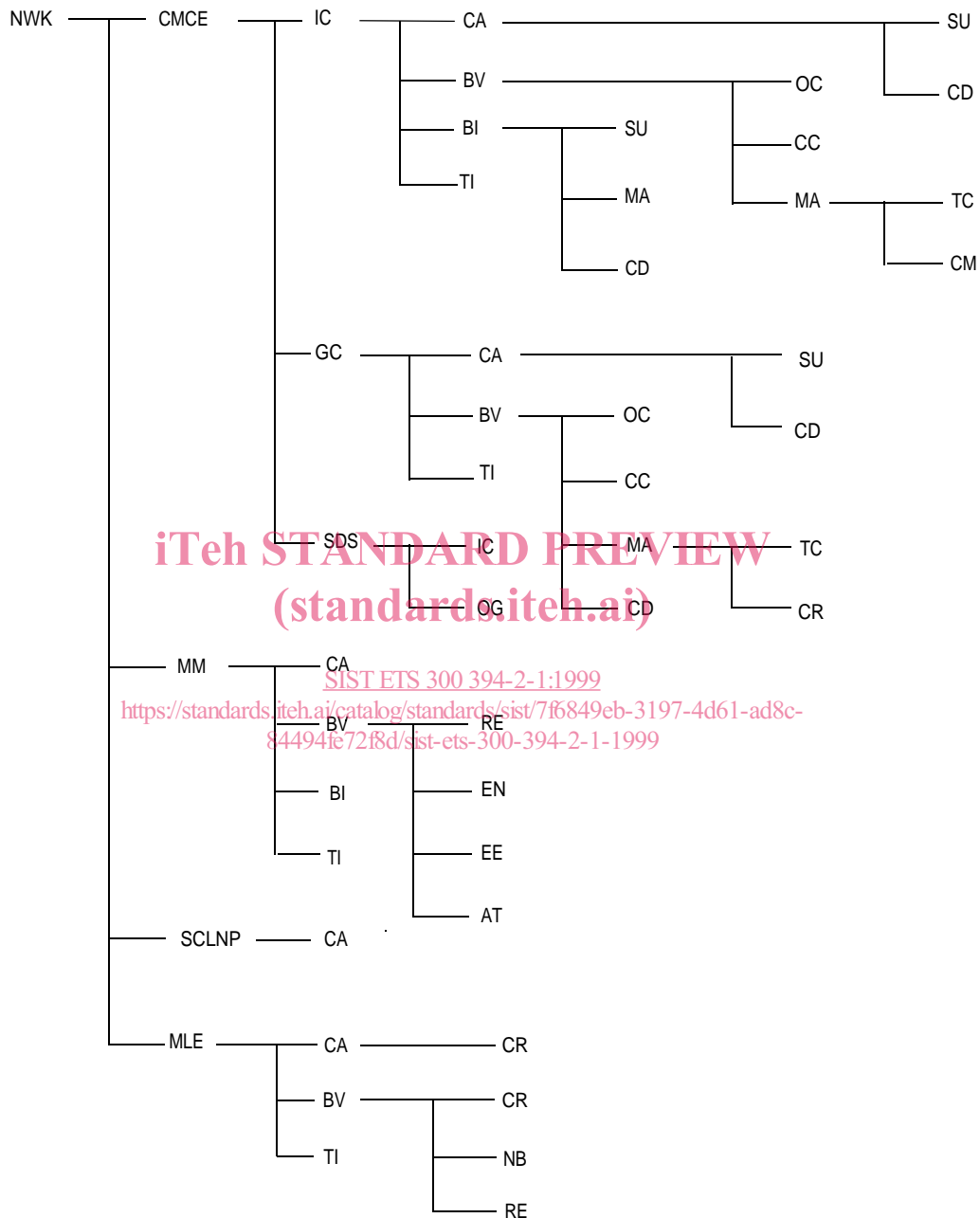


Figure 1: NWK layer TSS

#### 4.1.2 NWK layer test groups

The test groups are organized in several levels. The first level separates the NWK layer in different protocols. The second level generally separates protocol test in four functional test groups according to the type of testing: Capability test (CA), Valid Behaviour (BV), Invalid Behaviour (BI), and Timer tests (TI). The purpose of these test groups is explained in subclause 4.4. Exceptionally, the second level of the CMCE protocol creates functional modules which are then further on divided into these four functional test groups, i.e. CA, BV, BI, and TI. Further levels of the test subgroups are used to form more detailed division of protocol requirements, generally protocol procedures are used for naming the subgroups.

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

- Circuit Mode Control Entity (CMCE)
  - Individual Call (IC)
    - Capability tests (CA)
      - Call Setup (SU)
      - Call Disconnection (CD)
    - Valid Behaviour tests (BV)
      - Outgoing Call (OC)
      - Colliding Calls (CC)
      - Call Maintenance (MA)
        - Transmission Control (TC)
        - Call Modification (CM)
    - Invalid Behaviour tests (BI)
      - Call Setup (SU)
      - Call Maintenance (MA)
      - Call Disconnection (CD)
    - Timer Tests (TI)
  - Group Call (GC)
    - Capability tests (CA)
      - Call Setup (SU)
      - Call Disconnection (CD)
    - Valid Behaviour tests (BV)
      - Outgoing Call (OC)
      - Colliding Calls (CC)
      - Call Maintenance (MA)
        - Transmission Control (TC)
        - Call Restoration (CR)
      - Call Disconnection (CD)
    - Timer Tests (TI)
  - Short Data Service (SDS)
    - Incoming messages (IC)
    - Outgoing messages (OG)
- Mobility Management (MM)
  - Capability tests (CA)
  - Valid Behaviour tests (BV)
    - Registration (RE)
    - Enable/disable (EN)
    - Energy Economy Mode (EE)
    - Attachment/detachment of group identities (AT)
  - Invalid Behaviour tests (BI)
  - Timer tests (TI)
- Specific Connectionless Network Protocol (SCLNP)
  - Capability tests (CA)
- Mobile Link Entity (MLE)
  - Capability tests (CA)
    - Cell Reselection (CR)
  - Valid Behaviour tests (BV)
    - Cell Reselection (CR)
    - Network Broadcast (NB)
    - Call restoration (RE)
  - Timer tests (TI)

## 4.2 Logical Link Control (LLC) layer

### 4.2.1 Logical Link Control (LLC) layer TSS overview

The LLC layer TSS is illustrated in figure 2.

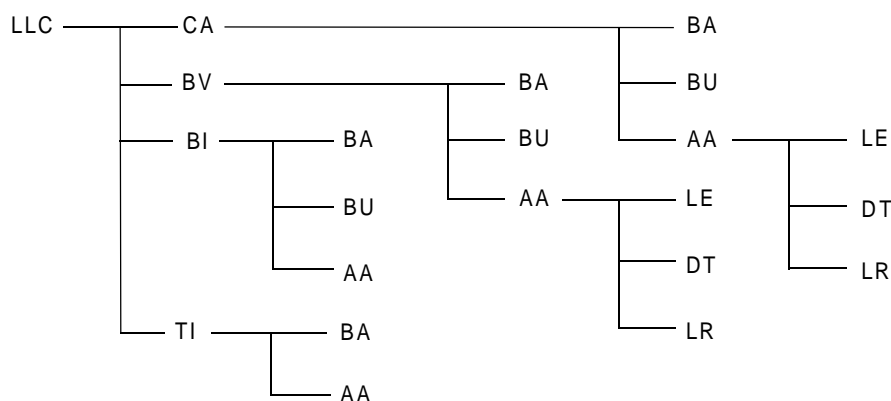


Figure 2: LLC layer TSS

### 4.2.2 LLC layer test groups

The first level of the LLC test groups separates the LLC test suite in four functional test groups: CA, BV, BI, and TI. The second level splits the test suite into different LLC services. Further levels of the test subgroups are used to form more detailed division of protocol requirements.

The following list defines the LLC layer test group names and identifiers:

#### Capability tests (CA)

Basic link, Acknowledged service (BA)

Basic link, Unacknowledged service (BU)

Advanced link, Acknowledged service (AA)

Link Establishment (LE)

Data Transfer (DT)

Link Release (LR)

#### Valid Behaviour tests (BV)

Basic link, Acknowledged service (BA)

Basic link, Unacknowledged service (BU)

Advanced link, Acknowledged service (AA)

Link Establishment (LE)

Data Transfer (DT)

Link Release (LR)

#### Invalid Behaviour tests (BI)

Basic link, Acknowledged service (BA)

Basic link, Unacknowledged service (BU)

Advanced link, Acknowledged service (AA)

#### Timer tests (TI)

Basic link, Acknowledged service (BA)

Advanced link, Acknowledged service (AA)

### 4.3 Medium Access Control (MAC) layer

#### 4.3.1 Medium Access Control (MAC) layer TSS overview

The MAC layer TSS is illustrated in figure 3.

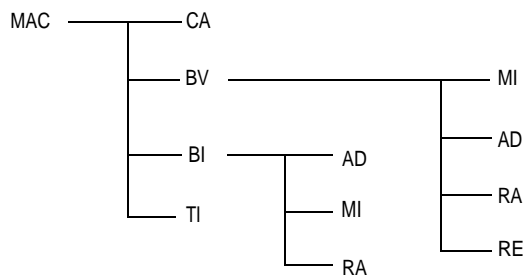


Figure 3: MAC layer TSS

#### 4.3.2 MAC layer test groups

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

The following list defines the MAC layer test group names and identifiers:

Capability tests (CA)

Valid behaviour tests (BV)

Minimum mode (MI)

Addressing (AD)

Random access (RA)

Reserved access (RE)

Invalid behaviour tests (BI)

Addressing (AD)

Minimum mode (MI)

Random access (RA)

Timer tests (TI)

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### 4.4 Test group description

Capability (CA) tests provide limited testing that the observable capabilities of the IUT are in accordance with the static conformance requirements and the additional capabilities claimed in the PICS/PIXIT. In particular, this test group can be regarded as a set of spot checks for all the capabilities of the IUT stated in the PICS/PIXIT. Scope of the test group is the observable capabilities of the IUT with respect to NWK layer connection, call control, and the mobility management.

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.

The Invalid Behaviour (BI) group is intended to verify that the IUT is able to react properly in case an invalid protocol data unit (message) occurring. Invalid PDU here means syntactically or semantically invalid test events generated by the test system. A syntactically or semantically invalid test event regardless of the current state is not allowed. Inopportune test cases are also included in this test group. These are intended to verify that the IUT is able to react properly in case an inopportune test event occurring. Such an event is syntactically correct, but occurs when it is not allowed.

Different timers and counters 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 this ETS in clauses 6, 7, and 8 for NWK layer, LLC layer and MAC layer respectively.

### 5.1 Test purpose definition conventions

The test purposes are defined following particular rules as shown in the table 1.

**Table 1: Test purpose definition rules**

TP Id	Reference Condition Initial state Stimulus Expected behaviour
TP Id: Reference: Condition: Initial State: Stimulus: Expected behaviour:	The TP Id is a unique identifier it shall be specified according to the TP naming conventions defined in the subclause below. The reference should contain the references of the subject to be validated by the actual TP (specification reference, clause, paragraph). The conditions applying to selecting the test purpose Defines in which initial state the IUT has to be, in order to apply the TP. The stimulus defines the test event to which the TP is related. Definition of the events that are expected from the IUT to conform to the base specification.  <a href="https://standards.iteh.ai/catalog/standards/sist/7f6849eb-3197-4d61-ad8c-84494fe72f8d/sist-ets-300-394-2-1-1999">SIST ETS 300 394-2-1:1999 https://standards.iteh.ai/catalog/standards/sist/7f6849eb-3197-4d61-ad8c-84494fe72f8d/sist-ets-300-394-2-1-1999</a>