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TECHNICAL SPECIFICATION

**Universal Mobile Telecommunications System (UMTS);
LTE;
5G;
User Equipment (UE) conformance specification for
UE positioning;
Part 4: Test suites
(3GPP TS 37.571-4 version 17.5.0 Release 17)**

Reference

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Introduction

The present document is part 4 of a multi-part conformance test specification. The specification contains a TTCN design frame work and the detailed test specifications in TTCN for the UE:

- A-GPS at the UTRA Uu interface in TTCN-2;

- A-GNSS at the UTRA Uu interface in TTCN-3;

- LTE positioning at the LTE-Uu interface in TTCN-3.

- NR positioning at the NR-Uu interface in TTCN-3.

The present document is part 4 of a multi-parts TS:

- 3GPP TS 37.571-1: User Equipment (UE) conformance specification for UE positioning; Part 1: Terminal conformance.

- 3GPP TS 37.571-2: User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance.

- 3GPP TS 37.571-3: User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS).

- **3GPP TS 37.571-4: User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites.**

- 3GPP TS 37.571-5: User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data.

1 Scope

The present document specifies the protocol and signalling conformance testing in TTCN for the UE:

- A-GPS at the UTRA Uu interface;

- LTE positioning at the LTE-Uu interface;

- A-GNSS at the UTRA Uu interface.

- NR positioning at the NR-Uu interface.

The following TTCN test specification and design considerations can be found in the present document:

- Test system architecture;

- Test models and ASP definitions;

- Test methods and usage of communication ports definitions;

- Test configurations;

- Design principles and assumptions;

- TTCN styles and conventions;

- Partial PIXIT proforma;

- Test suites in TTCN-2 and TTCN-3;

- The Test Suites designed and implemented in the present document are based on the test specifications in prose in 3GPP TS 37.571-2 [3];

- The applicability of the individual test cases is specified in the test ICS proforma specification in 3GPP TS 37.571-3 [4].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document unless the context in which the reference is made suggests a different Release is relevant (information on the applicable release in a particular context can be found in e.g. test case title, description or applicability, message description or content).

[1]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2]   3GPP TS 37.571-1: " User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification".

[3]   3GPP TS 37.571-2: " User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance".

[4]   3GPP TS 37.571-3: " User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS)".

[5]   3GPP TS 37.571-5: " User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data".

[6]   3GPP TS 36.523-3: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites".

[7]   3GPP TS 36.508: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing".

[8]   3GPP TS 34.123-3: "User Equipment (UE) conformance specification; Part 3: Abstract test suite (ATS)".

[9]   3GPP TS 34.108: "Common test environments for User Equipment (UE); Conformance testing".

[10]   3GPP TS 37.355: " LTE Positioning Protocol (LPP)".

[11]   3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[12]   3GPP TS 25.331: "Radio Resource Control (RRC); Protocol specification".

[13]   3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".

[14]   3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[15]   ITU-T Recommendation X.880: "Information technology - Remote Operations: Concepts, model and notation".

[16]   ITU-T Recommendation Q.773: "Transaction capabilities formats and encoding".

[17]   ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[18]   3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[19]   3GPP TS 23.038: "Alphabets and language-specific information".

[20]   ETSI TR 101 666 (V1.0.0): "Information technology; Open Systems Interconnection Conformance testing methodology and framework; The Tree and Tabular Combined Notation (TTCN) (Ed. 2++)".

[21]   3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[22]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[23]   3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation".

[24]   3GPP TS 38.523-3: "5GS; User Equipment (UE) conformance specification; Part 3: Protocol Test Suites".

[25]   3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[26]   3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[27]   3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[28]   3GPP TS 38.508-1: "5GS; User Equipment (UE) conformance specification; Part 1: Common test environment".

[29]   3GPP TS 38.211: "NR; Physical channels and modulation".

3   Definitions, symbols and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] apply.

3.2   Symbols

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] apply.

3.3   Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply:

ASP   Abstract Service Primitive

4   A-GPS system architecture and test model

A-GPS signalling conformance tests are specified in TTCN-2. The system architecture and the test model are based on 3GPP TS 34.123-3 [8].

4.1   ATS and module structure

Refer to 3GPP TS 34.123-3 [8], clause 5.

4.2   Upper tester

Refer to 3GPP TS 34.123-3 [8], clause 7.3.5.1.

4.3   SV PCO

Refer to 3GPP TS 34.123-3 [8], clause 7.3.5.2.

4.4   A-GPS Primitives

Refer to 3GPP TS 34.123-3[8], clause 7.3.5.3.

4.5   Specific test suite operation for A-GPS testing

Refer to 3GPP TS 34.123-3 [8], clause 8.7.7.

5 A-GNSS and LTE positioning system architecture and test models

5.1 Test system architecture

5.1.1 General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

5.1.2 Component architecture

Each access technology (RAT) is hosted by a separate TTCN-3 parallel component (PTC):

- E-UTRA PTC;

- UTRA PTC.

The PTCs are controlled by the TTCN-3 positioning master test component (POS MTC) which:

- Is an extension of the MTC as defined in 3GPP TS 36.523-3 [6], clause 4.1.2.

- Controls the SS Positioning Simulator.

Figure 5.1.2-1 shows this component architecture for an E-UTRA and UTRA scenario.
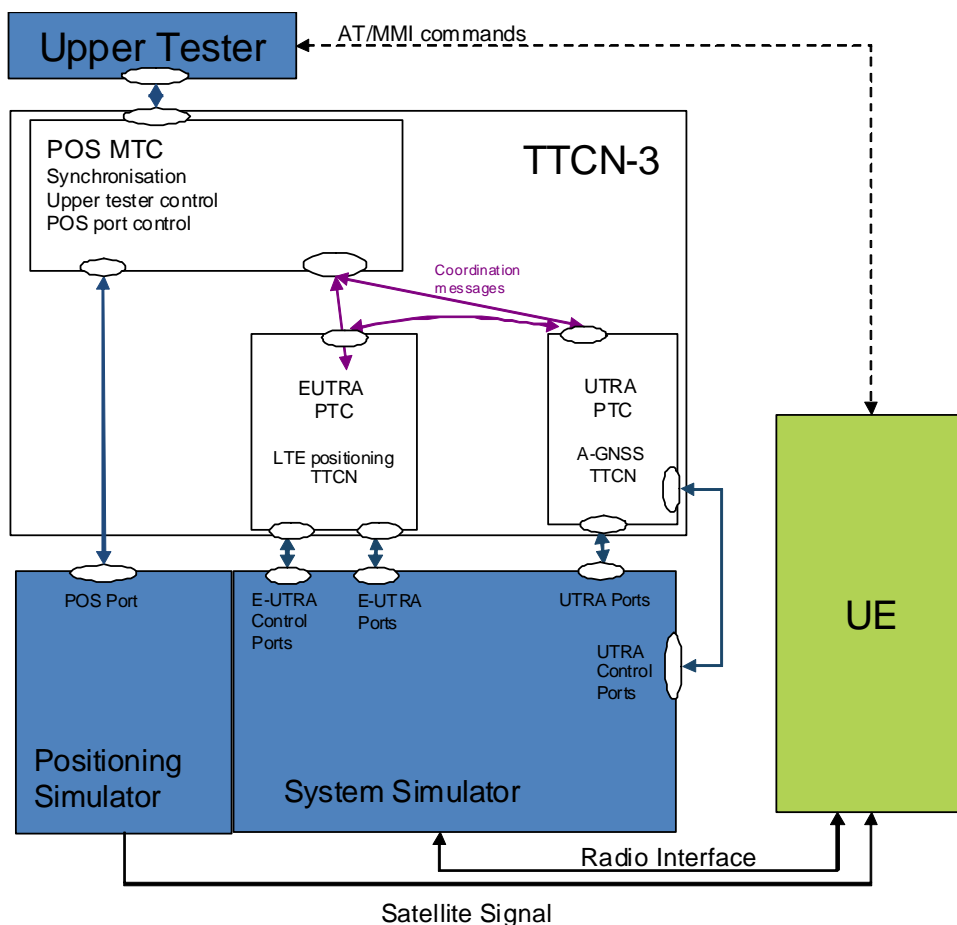
Figure 5.1.2-1: Component architecture for an E-UTRA and UTRA scenario

The PTCs are allocated according to the following principles:

- For LTE positioning tests cases, the E-UTRA PTC is created.

- For LTE positioning CS fallback test cases, E-UTRA and UTRA PTCs are created.

- For UTRA A-GNSS test cases, the UTRA PTC is created.

5.1.2.1 Interfaces

A number of interfaces are taken into consideration.

POS MTC - PTC:

Common synchronisation of PTCs.

Positioning simulator command/data coordination messages.

Upper tester primitives.

POS MTC - System Interface:

Upper tester primitives.

POS MTC- Positioning Simulator:

Positioning simulator command and data primitives.

PTC - PTC:

Primitives containing information for IRAT handover.

PTC - System Interface:

Primitives containing peer-to-peer message.

Configuration primitives.

5.2 Test model

In order to perform the LTE positioning and A-GNSS tests, the Positioning Simulator shall have two basic functional unites:

- Satellite simulator generating and broadcasting satellite signals.

- Assistance data source storing the data associated with the pre-defined GPS and GNSS test scenarios (see 3GPP TS 37.571-5 [5]).

This specification supports the following GNSS: GPS, Galileo, GLONASS and BDS.

5.2.1   LTE GNSS test model
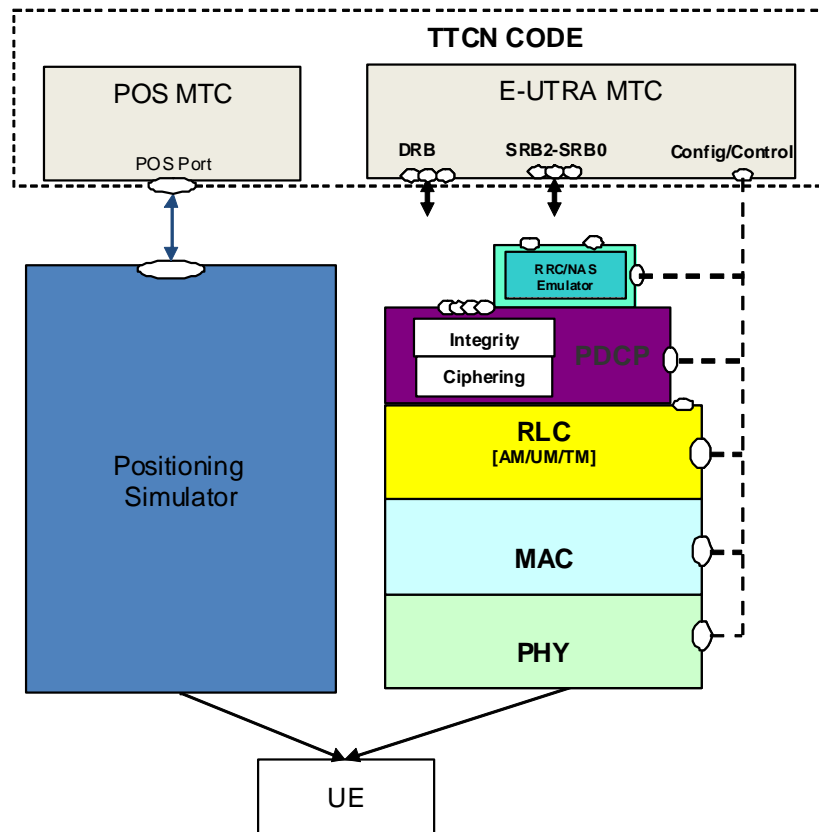
Figure 5.2.1-1: E-UTRA Test model for LTE positioning GNSS testing

The LTE positioning test model consists of an SS E-UTRAN protocol stack and a positioning simulator. The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6].

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

-    Load a pre-defined test scenario into the positioning simulator.

-    Start or stop generating and broadcasting satellite signals from the positioning simulator.

-    Retrieve the GNSS assistance data from assistance data source.

Under the ASP commands, the upper tester loads or re-loads pre-defined GNSS test scenario to the positioning simulator. The generated satellite signals shall simulate the GNSS environment as specified in 3GPP TS 37.571-2 [3], clause 5.

The SS also sends the GNSS assistance data to the UE through LPP signalling (see 3GPP TS 37.355 [10]) to facilitate the UE acquiring and tracking satellites. Such assistance data shall be consistent to within ±2 seconds with the satellite signals generated (see 3GPP TS 37.571-2 [3], clause 5.2.1).

The assistance data source shall provide the assistance data consistent to +1/-0 second with the GNSS test scenario currently running in the satellite simulator (i.e. the data shall be up to 1 second in advance of the scenario); this allows for a further 2 seconds of latency in the SS. In case multiple satellite systems are configured in a test, the assistance data are requested or retrieved in a single ASP command for all satellite systems.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

5.2.2   UTRA A-GNSS test model
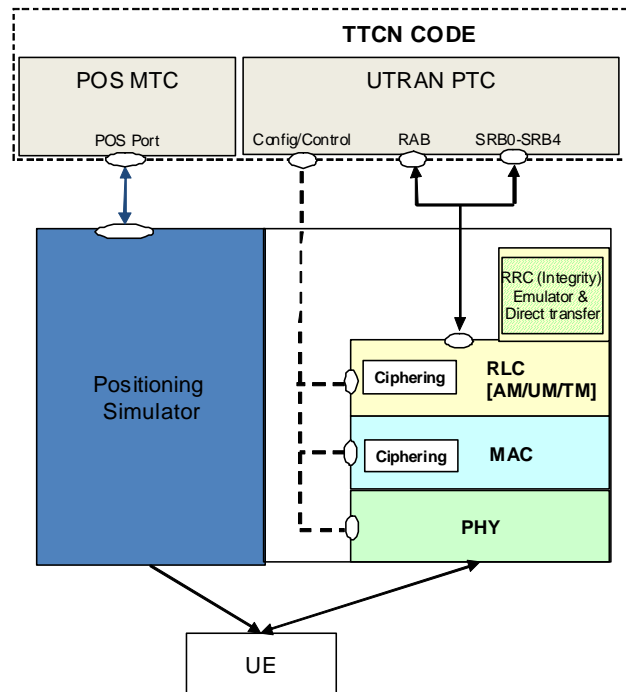
Figure 5.2.2-1: UTRA Test model for A-GNSS testing

The A-GNSS test model consists of an SS UTRAN protocol stack and a positioning simulator. The SS UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6], clause 4.4.1.

The UE is configured in normal mode. Ciphering and Integrity (RRC) are enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

-   Load a pre-defined test scenario into the positioning simulator.

-   Start or stop generating and broadcasting satellite signals from the positioning simulator.

-   Retrieve the GPS and GNSS assistance data from assistance data source.

Under the ASP commands, the upper tester loads or re-loads pre-defined GPS or GNSS test scenario to the positioning simulator. The generated satellite signals shall simulate the A-GPS and A-GNSS environment as specified in 3GPP TS 37.571-2 [3], clause 4.2.

The SS also sends the GPS or GNSS assistance data to the UE through RRC signalling to facilitate the UE acquiring and tracking satellites. Such assistance data shall be consistent to within ±2 seconds with the satellite signals generated (see 3GPP TS 37.571-2 [3], clause 4.2).

The assistance data source shall provide the assistance data consistent to +1/-0 second with the GPS or GNSS test scenario currently running in the satellite simulator (i.e. the data shall be up to 1 second in advance of the scenario); this allows for a further 2 seconds of latency in the SS. In case multiple satellite systems are configured in a test, the assistance data are requested or retrieved in a single ASP command for all satellite systems.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

5.3 ASP specifications

The E-UTRAN and UTRAN ASP definitions are specified according to 3GPP TS 36.523-3 [6], clause 6.

The positioning simulator ASP definitions are documented in annex C.

5.4 LTE OTDOA test model
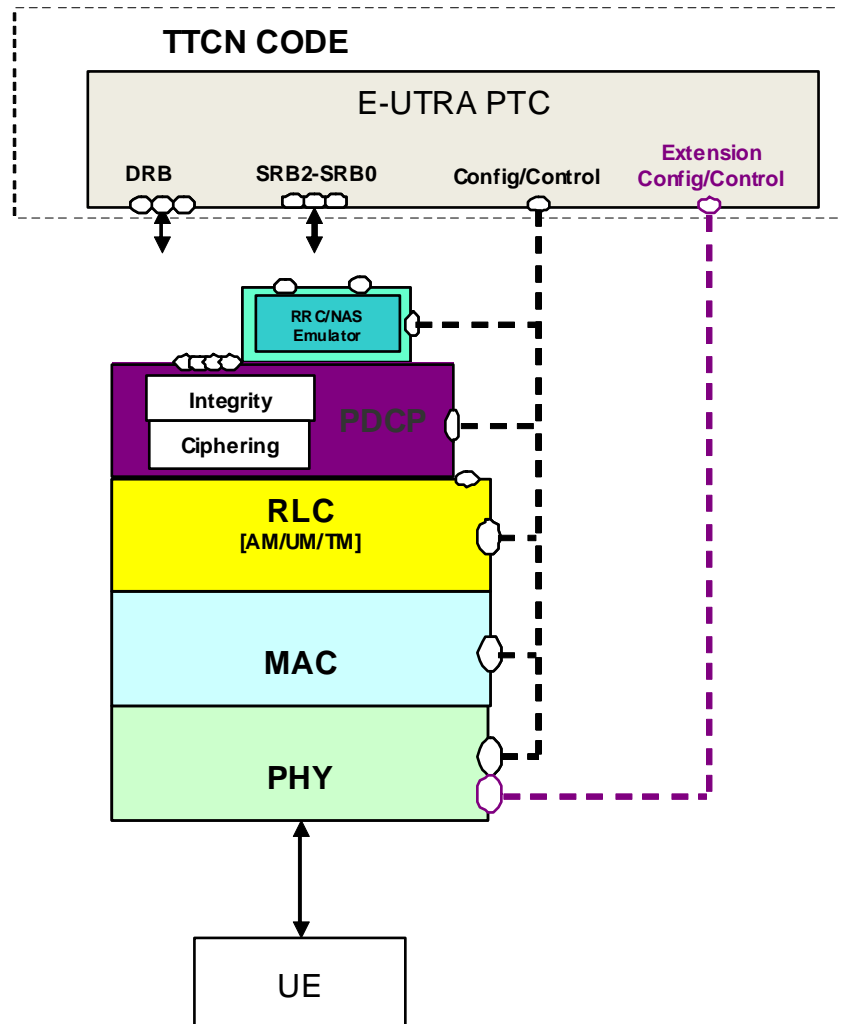
Figure 5.4-1: E-UTRA OTDOA test model

The LTE OTDOA test model consists of an SS E-UTRAN protocol stack. The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6] with an additional port to configure the antenna port 6 and the Positioning Reference Signal (PRS) in the LTE cells. The extension of LTE ASPs is defined in annex C.

The simulated OTDOA environment is specified in 3GPP TS 37.571-2 [3], clause 5.2.2), cells are synchronous and configured with the timing offset set to 0. The PRS is transmitted according to 3GPP TS 36.211 [23], clause 6.10.4.

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The PRS signals are transmitted by the SS E-UTRAN, the assistance data are written in TTCN.

5.5 LTE ECID test model

The test model is referred to the LTE positioning test model defined in clause 5.2.1; except that no satellite signals are required.

6 LTE indoor positioning system architecture and test models

6.1 Test system architecture

6.1.1 General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

6.1.2 Component architecture

The same architecture as in 5.1.2 applies, excluding the UTRA PTC.
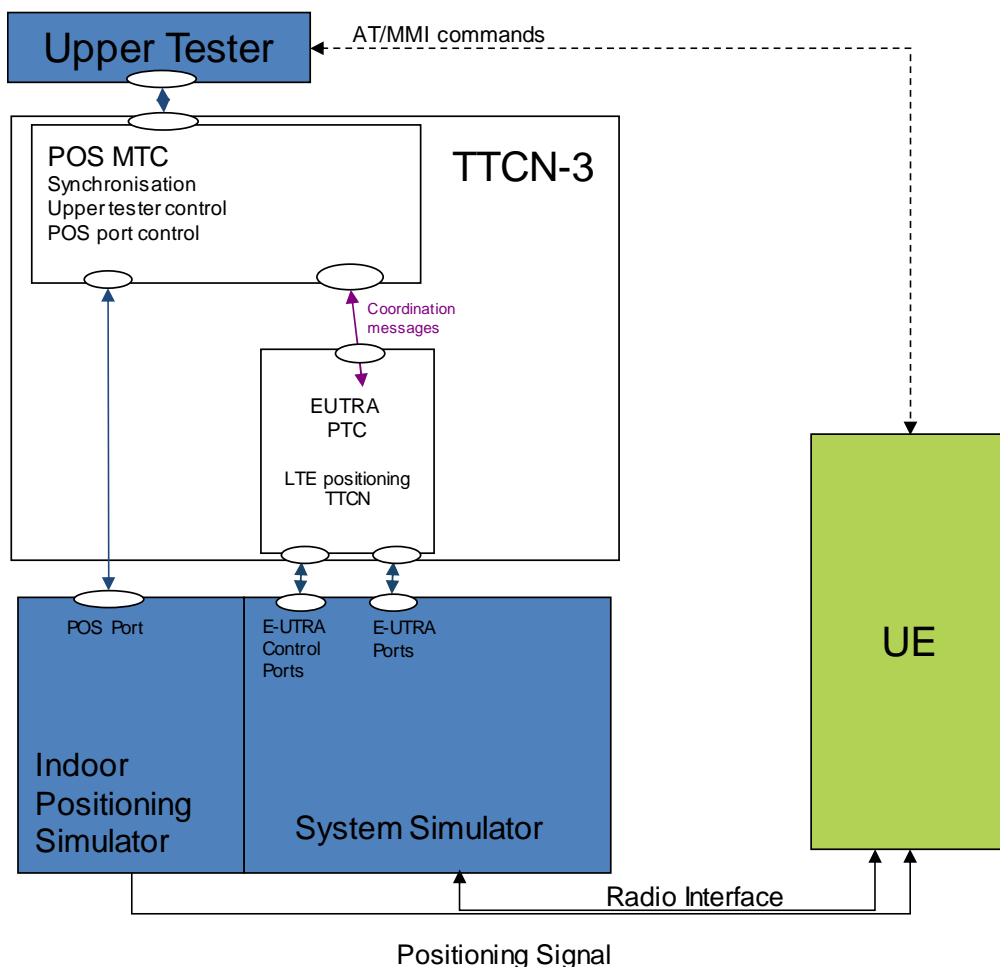
Figure 6.1.2-1: Component architecture for an E-UTRA scenario

6.1.2.1   Interfaces

Refer to 5.1.2.1.

6.2   Test model

6.2.1   LTE indoor positioning test model
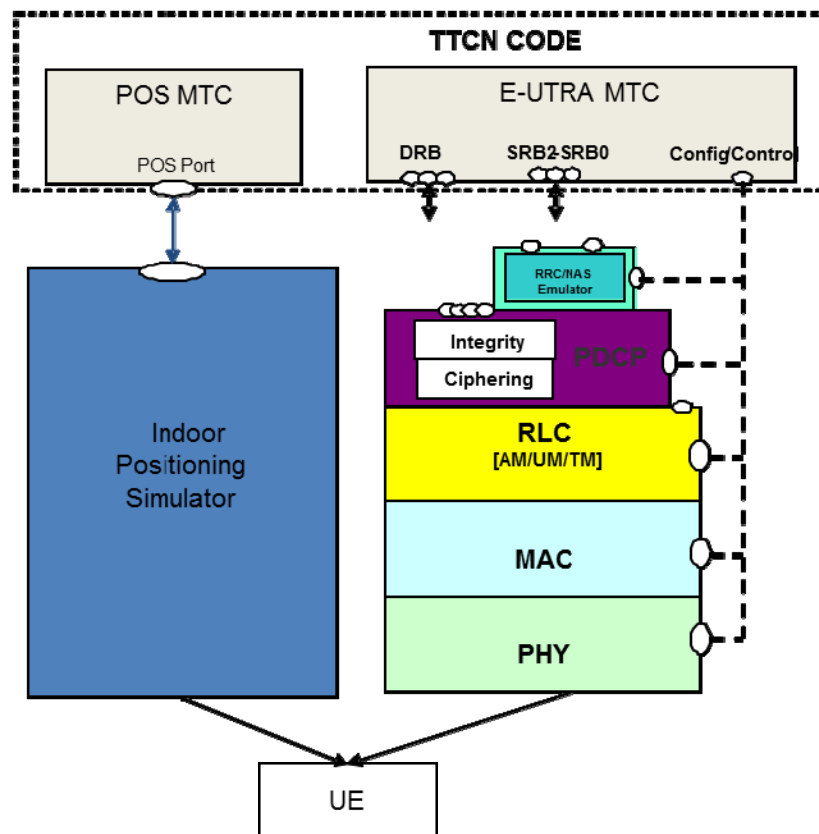
Figure 6.2.1-1: E-UTRA Test model for LTE indoor positioning testing

The LTE Indoor Positioning test model consists of an SS E-UTRAN protocol stack and an Indoor Positioning simulator. Depending on the Indoor Positioning Technology to be tested, the Indoor Positioning simulator will generate:

-    MBS beacon signals, for MBS test cases;

-    WLAN signals, for WLAN test cases;

-    Bluetooth signals, for Bluetooth test cases.

-    The Indoor Positioning simulator will be switched off for Sensor test cases.

     The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6].

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

-    Load a pre-defined test scenario into the Indoor Positioning simulator.

-    Start or stop generating and broadcasting signals from the Indoor Positioning simulator.

- Retrieve the appropriate (MBS, WLAN, Sensor) assistance data from the assistance data source.

Under the ASP commands, the upper tester loads or re-loads pre-defined test scenario to the Indoor Positioning simulator. The generated signals shall simulate the corresponding Indoor Positioning environment as specified in 3GPP TS 37.571-2 [3], clause 5.

The SS also sends the appropriate assistance data to the UE through LPP signalling (see 3GPP TS 37.355 [10]) to facilitate the UE acquisition of MBS Beacons or WLAN APs. For UE-based tests, the SS also sends the appropriate assistance data to enable the UE to calculate its position for MBS or WLAN tests, or calculate altitude based on barometric pressure sensor measurements.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

6A   LTE test models requiring GNSS support

Several LTE test models specified in TS 36.523-3 [6] require the presence of a GNSS emulation. Those are:

- V2X services: refer to TS 36.523-3 [6] clause 4.2.11

- Aerial UE: refer to TS 36.523-3 [6] clause 4.2.12

The positioning simulator shall be capable of generating and broadcasting the following GNSS: GPS, Galileo, GLONASS and BDS.

The ASPs at POS Port for the both test models are used to:

- Load a pre-defined test scenario into the positioning simulator.

- Start or stop generating and broadcasting satellite signals from the positioning simulator.

The ASPs at POS Port for V2X services are additionally used to:

- Trigger the positioning simulator to move in the test scenario to the next geographical area or zone.

- Trigger the positioning simulator to switch on/off the transmitter without stopping the UTC time sequence.

The ASPs at POS Port for aerial UE communication are additionally used to:

- Set an initial altitude above the sea level. Geographical latitude and longitude are defined in the test scenario and remain constant during the test execution.

- Trigger the positioning simulator to simulate a vertical movement in the test scenario towards a specified altitude level.

6B   NG-RAN NR positioning system architecture and test models

6B.1   Test system architecture

6B.1.1   General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

6B.1.2   Component architecture

The NR PTC is controlled by the TTCN-3 positioning master test component (POS MTC) which:

- Is an extension of the MTC as defined in 3GPP TS 38.523-3 [24], clause 4.2.

- Controls the SS Positioning Simulator.
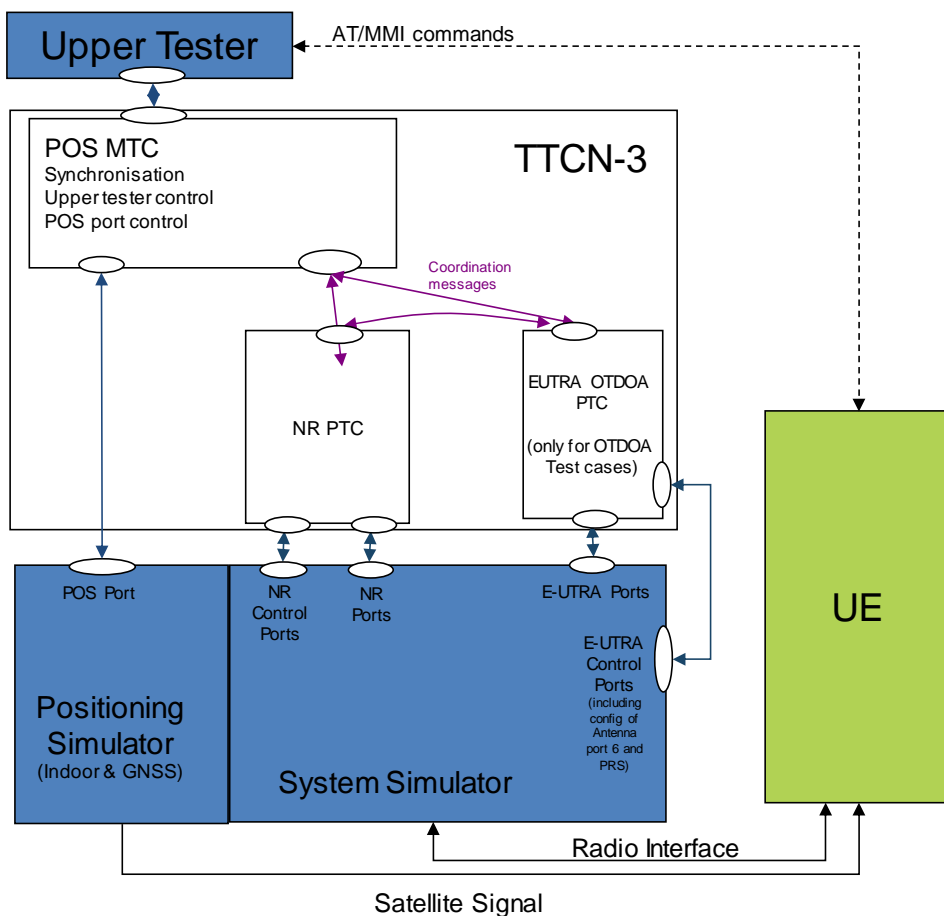
Figure 6B.1.2-1: Component architecture for a NR scenario

As specified in TS 37.571-2 [2], subclause 8.2.8:

- The connection between the Position Simulator and the UE (Satellite signal) shall be conducted.

- The connection between the System Simulator and the UE (Radio Interface) shall be conducted for NR FR1 and radiated (OTA) for NR FR2.

6B.2   Test models

6B.2.1   NR GNSS positioning test model

The NR positioning test model consists of an SS NR protocol stack and a positioning simulator. The SS NR/5GC emulation part is the same the model defined in 3GPP TS 38.523-3 [24]. The positioning simulator is the same as for LTE positioning test model defined in clause 5.2.1.
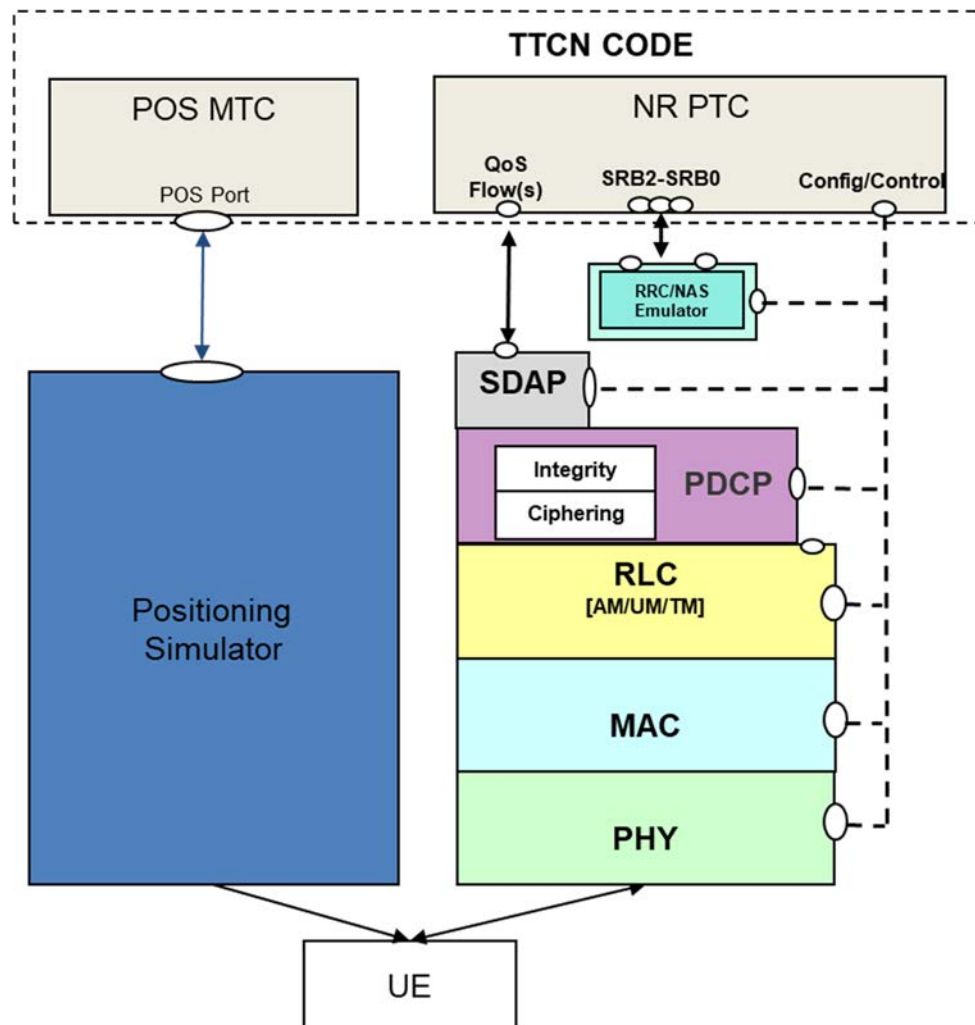
Figure 6B.2.1-1: Test model for NR GNSS positioning testing

6B.2.2 NR indoor positioning test model

The NR indoor positioning test model is the same as the NR positioning test model in clause 6B.2.1 but replacing the Positioning simulator with an Indoor Positioning simulator. The same principles as in clause 6.2.1 apply but replacing LTE with NR.

6B.2.3 NR OTDOA (LTE) positioning test model

OTDOA measurements are not supported on NR cells in Rel-15. The OTDOA measurements are provided by LTE cells instead. The UE will be attached to an NR cell and the LPP session will be established over NR/5GC NAS. The UE will report OTDOA RSTD measurements from LTE neighbour cells.

The NR OTDOA (LTE) positioning model consists of an SS NR/5GC protocol stack and a SS E-UTRAN protocol stack. The SS NR/5GC emulation part is the same as the model defined in 3GPP TS 38.523-3 [34]. The SS E-UTRAN emulation part is the same as the model defined in clause 5.4 (i.e. including an additional port to configure the antenna port 6 and the Positioning Reference Signal (PRS) in the LTE cells). The E-UTRA PTC will not be connected to NASEMU or IMS/IP PTCs.
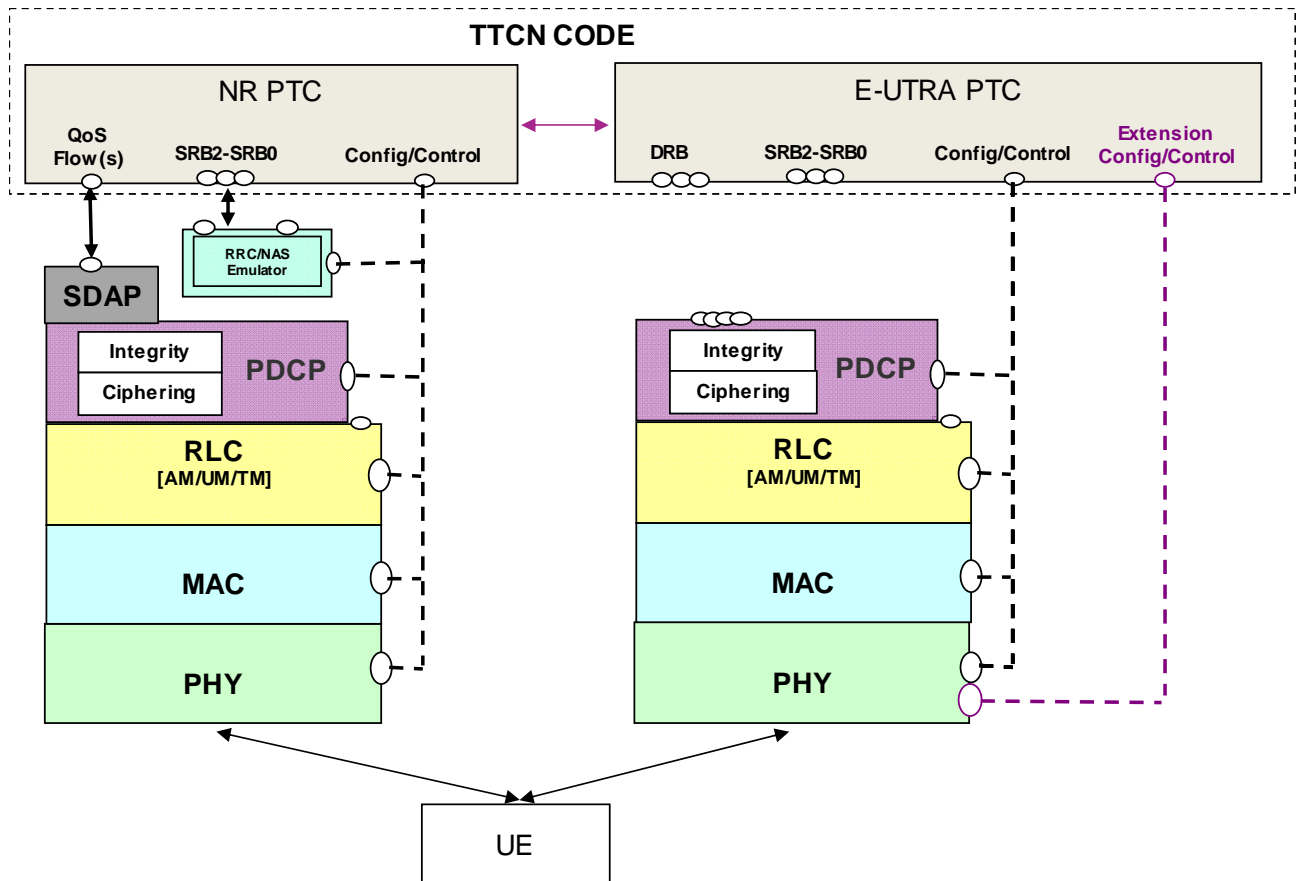
Figure 6B.2.3-1: Test model for NR OTDOA (LTE) positioning testing

6B.2.4   NR Multi-RTT, DL-AoD and DL-TDOA positioning test model
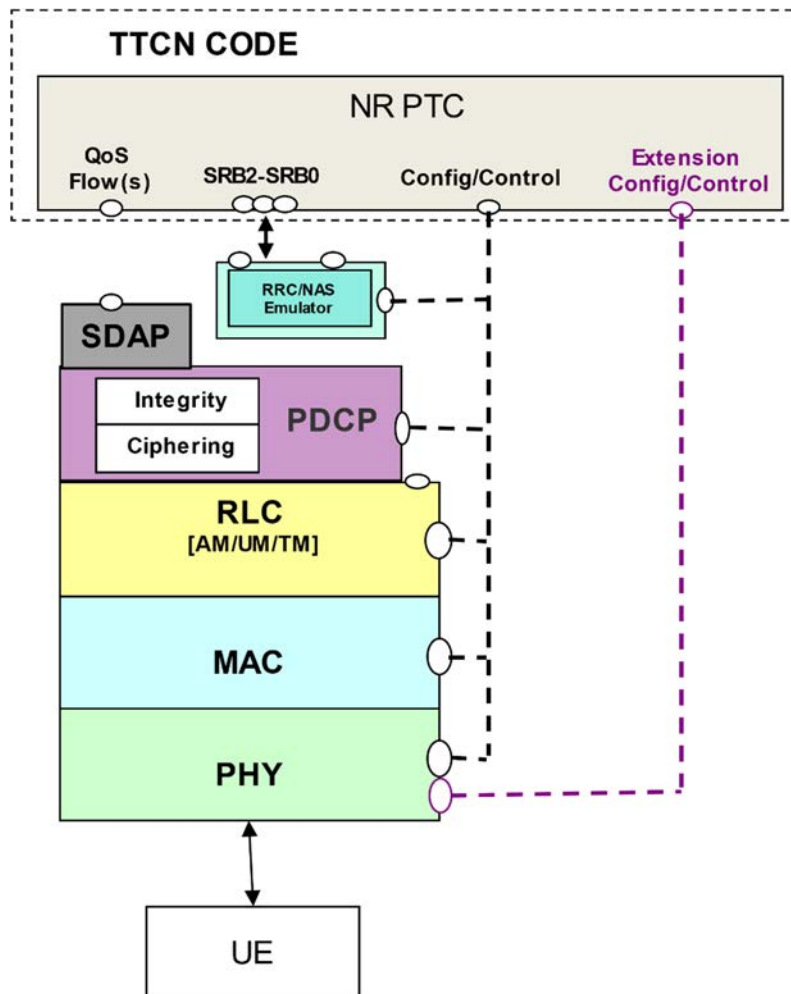
Figure 6B.2.4-1: NR Multi-RTT, DL-AoD and DL-TDOA test model

The NR Multi-RTT, DL-AoD and DL-TDOA test model is the same as the NR/5GC Layer 3 test model (TS 38.523-3 [24], clause 5.2.1.1) with an additional port to configure the DL Positioning Reference Signal (DL-PRS) in the NR cells. The extension of NR ASPs is defined in annex X [TBD].

The simulated NR Multi-RTT, DL-AoD and DL-TDOA environments are specified in TS 37.571-2 [3], clauses 8.2.9, 8.2.10 and 8.2.11, respectively. The DL-PRS is transmitted according to TS 38.211 [29], clause 7.4.1.7.

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The DL-PRS is transmitted by the physical layer of the NR cell(s) in the SS. The assistance data to provide the UE with the configuration of the DL-PRS is sent from the SS to the UE via LPP signalling.

For Multi-RTT, the SS will be also configured through the NR_SYS port to receive UL-SRS from the UE.

6B.2.5   NR E-CID test model

The test model is the same as the NR/5GC Layer 3 test model (TS 38.523-3 [24], clause 5.2.1.1).

6C NR/5GC test models requiring GNSS support

The NR sidelink test model specified in TS 38.523-3 [24] clause 5.2.1.6 requires the presence of a GNSS emulation.

The positioning simulator shall be capable of generating and broadcasting the following GNSS: GPS, Galileo, GLONASS and BDS.

The ASPs at POS Port for NR sidelink are used to:

- Load a pre-defined test scenario into the positioning simulator.

- Start or stop generating and broadcasting satellite signals from the positioning simulator.

- Trigger the positioning simulator to move in the test scenario to the next geographical area or zone.

- Trigger the positioning simulator to switch on/off the transmitter without stopping the UTC time sequence.

- Retrieve the current UTC time of the GNSS scenario.

7 Upper Tester Interface

7.1 MMI for A-GPS

Refer to 3GPP TS 34.123-3 [8], clause B.1.12.

7.2 MMI for A-GNSS, LTE and NR positioning

Refer to 3GPP TS 36.523-3 [6], clause 5.

The following MMI commands are defined for A-GNSS, LTE and NR positioning.

Table 7.2-1: MMI commands

Command	Parameters	
	Name	**Value**
"CHECK_LCS_CLIENT"	none	
"LOCATION_INFO"	none	

Table 7.2-2: MMI commands imported from 3GPP TS 36.523-3 [6], clause 5

Command
"SWITCH_ON"
"SWITCH_OFF"
"POWER_ON"
"POWER_OFF"
"CHECK_DTCH_THROUGHCON NECTED"
"CLEAR_STORED_ASSISTANCE _DATA"

The following AT commands are applied in TTCN.

Table 7.2-3: AT Commands

Command	Reference
AT+CMOLR	TS 27.007 [32]
AT+CMTLR	TS 27.007 [32]
AT+CMTLRA	TS 27.007 [32]

8 IXIT Proforma

8.1 A-GPS test suite parameters declarations

Refer to 3GPP TS 34.123-3 [8], clause B.1.13.

8.2 A-GNSS, LTE and NR positioning test suite parameters declarations

Same PIXIT parameters are referred to clause 8.1.

Table 8.2-1: Void

9 Other SS Requirements with TTCN-3 impact

9.1 Codec Requirements

Refer to 3GPP TS 36.523-3 [6] clause 8.1 and TS 38.523-3 [24] clause 8.1.

Annex A (normative):
Test Suites

This annex contains the approved TTCN Test Suites.

A.1 UTRA A-GPS test suite

This annex includes the reference to those approved A-GPS ATS which are contained in 3GPP TS 34.123-3 [8], clause A.11.

The ATSs have been produced using the Tree and Tabular Combined Notation (TTCN2) according to TR 101 666 [20].

A.1.1 Baseline of specifications

Table A.1.1-1 shows the baseline of the relevant core specifications and the test specifications which the delivered ATSs are referred to.

Table A.1.1-1: Versions of the test and Core specifications

Core specifications	3GPP TS 25.331 [12]
Test specifications	3GPP TS 37.571-2 [3]
	3GPP TS 37.571-3 [4]
	3GPP TS 37.571-5 [6]
	3GPP TS 34.123-3 [8]
	3GPP TS 34.108 [9]
	3GPP TS 34.109 [18]

A.1.2 AGPS ATS

The approved AGPS test cases are listed. An "X" in columns FDD or LCR TDD indicates the test case approved for the relevant ATS.

Table A.1.2-1: AGPS TTCN test cases

Test case reference		Description	FDD	TDD
TS 37.571-2 [3]	TS 34.123-3 [8]			
6.1.1.1	17.2.2.1	LCS Network Induced location request/UE-Based GPS/Emergency Call/with USIM	X	
6.1.1.2	17.2.2.2	LCS Network Induced location request/UE-Based GPS/Emergency Call/without USIM	X	
6.1.1.3	17.2.2.3	LCS Network induced location request/UE-Assisted GPS/Emergency call/With USIM	X	
6.1.1.4	17.2.2.4	LCS Network induced location request/UE-Assisted GPS/Emergency call/Without USIM	X	
6.1.2.1	17.2.3.2	LCS Mobile originated location request/UE-Based GPS/Position estimate request/Success	X	
6.1.2.7	17.2.3.9	LCS Mobile originated location request/UE-Assisted GPS/Position Estimate/Success	X	
6.1.3.1	17.2.4.1	LCS Mobile terminated location request/UE-Based GPS	X	
6.1.3.2	17.2.4.2	LCS Mobile-terminated location request/UE-Based GPS/Request for additional assistance data/Success	X	
6.1.3.3	17.2.4.3	LCS Mobile-terminated location request/UE-Based GPS/Failure - Not Enough Satellites	X	
6.1.3.4	17.2.4.4	LCS Mobile terminated location request/UE-Assisted GPS/Success	X	
6.1.3.5	17.2.4.5	LCS Mobile terminated location request/UE-Assisted GPS/Request for additional assistance data/Success	X	
6.1.3.7	17.2.4.7	LCS Mobile terminated location request/UE-Based GPS/Privacy Verification/Location Not Allowed if No Response	X	

A.1.3   The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to the corresponding FDD ATS is referred to 3GPP TS 34.123-3 [8], clause A.11.

A.2   UTRA A-GNSS, LTE and NR/5GC positioning test suite

The test suites have been produced using the Testing and Test Control Notation version 3 (TTCN-3) according to ES 201 873-1 [17].

A.2.1   Baseline of specifications

Table A.2.1-1 shows the baseline of the relevant core specifications and the test specifications which the delivered TTCN test suites are referred to.

Table A.2.1-1: References of the test and Core specifications

Core specifications baseline	3GPP TS 37.355 [10]
	3GPP TS 24.301 [11]
	3GPP TS 25.331 [12]
	3GPP TS 24.501 [25]
	3GPP TS 36.331 [26]
	3GPP TS 38.331 [27]
Test specifications	3GPP TS 37.571-2 [3]
	3GPP TS 37.571-3 [4]
	3GPP TS 37.571-5 [5]
	3GPP TS 36.508 [7]
	3GPP TS 38.508-1 [28]

The Test Suite in TTCN3 is contained in multiple ASCII files which accompany the present document.

A.2.2   E-UTRA LTE positioning Test Cases

Table A.2.2-1 lists all approved test cases.

Table A.2.2-1: E-UTRA LTE positioning TTCN test cases

Test case	Description
7.1.1	UE Network Capability
7.2.1.1	Location Notification
7.2.1.2	Privacy Verification – Location Allowed if no Response
7.2.1.3	Privacy Verification – Location not Allowed if No Response
7.2.2.2.5s	Basic Self Location: UE-assisted sub-test 5
7.2.2.2.6.FDDs	Basic Self Location: UE-assisted sub-test 6 (FDD)
7.2.2.2.6.TDDs	Basic Self Location: UE-assisted sub-test 6 (TDD)
7.3.1.1	Position Capability Transfer
7.3.2.1	LPP Duplicated Message
7.3.2.2	LPP Acknowledgment
7.3.2.3	LPP Retransmission
7.3.3.1	LPP Requested Method not Supported – UE-Assisted sub-test 1
7.3.4.2.5s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 5
7.3.4.2.6s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 6
7.3.4.2.7s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 7
7.3.4.4.5s	E-SMLC Initiated Position Measurement without assistance data: UE-Assisted sub-test 5
7.3.4.4.7s	E-SMLC Initiated Position Measurement without assistance data: UE-Assisted sub-test 7
7.3.5.1.5s	E-SMLC initiated Abort sub-test 5

A.2.3   UTRA A-GNSS Test Cases

Table A.2.3-1 lists all approved test cases.

Table A.2.3-1: UTRA A-GNSS TTCN test cases

Test case	Description
6.2.1.1.4s	NI-LR Emergency Call: UE-Based A-GNSS sub-test 4
6.2.2.1.4s	MO-LR Position Estimate: UE-Based A-GNSS sub-test 4
6.2.2.3.4s	MO-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites sub-test 4
6.2.3.2.4s	MT-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites sub-test 4
6.2.3.3	Location Notification
6.2.3.4	Privacy Verification - Location Allowed if No Response
6.2.3.5	Privacy Verification - Location Not Allowed if No Response

A.2.4   NR/5GC Test Cases

Table A.2.4-1 lists all approved test cases.

Table A.2.4-1: NR/5GC TTCN test cases

Test case	Description
9.3.1.1.NR5GC	Position Capability Transfer
9.3.1.2.5s.NR5GC	LPP Abort: Subtest 5
9.3.1.2.15s.NR5GC	LPP Abort: Subtest 15
9.3.1.2.19s.NR5GC	LPP Abort: Subtest 19
9.3.1.2.20s.NR5GC	LPP Abort: Subtest 20
9.3.1.2.21s.NR5GC	LPP Abort: Subtest 21
9.3.2.1.NR5GC	LPP Duplicated Message
9.3.2.2.NR5GC	LPP Acknowledgement
9.3.2.3.NR5GC	LPP Retransmission
9.3.4.1.15s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based: Subtest 15
9.3.4.2.15s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 15
9.3.4.2.19s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 19
9.3.4.2.20s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 20
9.3.4.2.21s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 21
9.3.4.2.22s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 22
9.3.4.3.15s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Based: Subtest 15
9.3.4.4.15s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Assisted: Subtest 15
9.3.4.4.19s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Assisted: Subtest 19
9.3.4.4.20s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Assisted: Subtest 20
9.3.4.4.21s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Assisted: Subtest 21

Annex B (informative):
ASN.1 modules

B.1   A-GPS ASN.1 module

Refer to 3GPP TS 34.123-3 [8], annex H.1.

B.2   A-GNSS ASN.1 modules

Refer to 3GPP TS 34.123-3 [8], annex H.2.

B.3   LPP ASN.1

The LPP asn.1 modules are extracted from 3GPP TS 37.355 [10] without any change.

Annex C (informative)
TTCN-3 Definitions

C.1   EUTRA_POS_ASP_TypeDefs

Type definitions for configuration of Positioning Reference Signal in the system simulator;
Common design principles: refer to 3GPP TS 36.523-3 [6] annex D.

C.1.1   System_Configuration_PosExt

Formal ASP Definitions for EUTRA PRS system configuration

SystemRequest_PosExt_Type

TTCN-3 Union Type		
Name	**SystemRequest_PosExt_Type**	
Comment	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6] annex D	
Cell	CellConfigRequest_PosExt_Type	configure PRS in an LTE cell; the cell shall be configured as usual beforehand and SS shall raise an error when the cell does not exist yet; there is no explicit release of the PRS but the whole cell needs to be released

SystemConfirm_PosExt_Type

TTCN-3 Union Type		
Name	**SystemConfirm_PosExt_Type**	
Comment	confirmations for system configuration; in general to be sent after the configuration has been done	
Cell	Null_Type	(no further parameters from SS)

C.1.2 Cell_Configuration_PosExt

Specific Info for PRS Cell Configuration Primitive

C.1.2.1 Cell_Configuration_Common_PosExt

CellConfigRequest_PosExt_Type

TTCN-3 Union Type		
Name	**CellConfigRequest_PosExt_Type**	
Comment	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6] annex D	
AddOrReconfigure	CellConfigInfo_PosExt_Type	for PRS configuration of given cell: CellId : identifier of the cell to be configured RoutingInfo : None TimingInfo : Now (for initial configuration and for reconfiguration in general) ControlInfo : CnfFlag:=true; FollowOnFlag:=false (in general)

CellConfigInfo_PosExt_Type

TTCN-3 Record Type			
Name	**CellConfigInfo_PosExt_Type**		
Comment	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6] annex D common information for initial cell configuration or reconfiguration; in case of reconfiguration OMIT means 'keep configuration as it is'		
Basic	BasicCellConfig_PosExt_Type	opt	Extended PRS information for a cell

BasicCellConfig_PosExt_Type

TTCN-3 Record Type			
Name	**BasicCellConfig_PosExt_Type**		
Comment	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6] annex D Physical layer:		
PhysicalLayerConfigDL	PhysicalLayerConfigDL_PosExt_Type	opt	Default settings regarding physical control PRS signal

C.1.2.2 Downlink_Physical_Layer_Configuration_PosExt

Downlink physical layer configuration:
- DL antenna configuration for port 6.
- PRS configuration.

AntennaPort6_Config_Type

TTCN-3 Record Type			
Name	**AntennaPort6_Config_Type**		
Comment	to configure antenna port 6 for positioning; all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
Port	AntennaPort_Type	opt	
PRS	PRS_Info	opt	
RelativeTxPower	ToRS_EPRE_Ratio_Type	opt	power ratio for DI-PRS resource elements relative to the RS

PhysicalLayerConfigDL_PosExt_Type

TTCN-3 Record Type			
Name	**PhysicalLayerConfigDL_PosExt_Type**		
Comment	all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
AntennaPort6	AntennaPort6_Config_Type	opt	

C.1.3 System_Interface_PosExt

SYSTEM_CTRL_POSEXT_REQ

TTCN-3 Record Type			
Name	**SYSTEM_CTRL_POSEXT_REQ**		
Comment			
Common	ReqAspCommonPart_Type		For configuration of antenna port 6 TimingInfo is now
Request	SystemRequest_PosExt_Type		configure a PRS in a cell

SYSTEM_CTRL_POSEXT_CNF

TTCN-3 Record Type			
Name	**SYSTEM_CTRL_POSEXT_CNF**		
Comment			
Common	CnfAspCommonPart_Type		TimingInfo is ignored by TTCN => SS may set TimingInfo to "None"
Confirm	SystemConfirm_PosExt_Type		

EUTRA_SYSTEM_POSEXT_PORT

TTCN-3 Port Type		
Name	**EUTRA_SYSTEM_POSEXT_PORT**	
Comment	EUTRA PTC: Ext Port for system configuration of antenna port 6	
out	SYSTEM_CTRL_POSEXT_REQ	
in	SYSTEM_CTRL_POSEXT_CNF	

C.2 References to TTCN-3

References to TTCN-3		
EUTRA_POS_ASP_ TypeDefs	EUTRA/EUTRA_POS_ASP_TypeDefs.ttcn	Rev 36622

Annex D (informative)
Positioning System Simulator ASP Definitions in TTCN-3

D.1 PosSystem_ASP_TypeDefs

PosSystem_ASP_TypeDefs: Constant Definitions

TTCN-3 Basic Types			
tsc_MaxPosSystems	integer	12	

PositioningSystemType

TTCN-3 Enumerated Type	
Name	**PositioningSystemType**
Comment	
gps	
modernizedGPS	
glonass	
galileo	
qzss	
otdoa	
ecid	
bds	
mbs	
wlan	
bluetooth	
sensor	

PositioningSystemList_Type

TTCN-3 Record of Type	
Name	**PositioningSystemList_Type**
Comment	
record length (1..tsc_MaxPosSystems) of PositioningSystemType	

Altitude_Type

TTCN-3 Record Type		
Name	**Altitude_Type**	
Comment		
Height	integer	Height above a sea level in meters

D.1.1 PosSystem_Load_Scenario

Load scenarios follow 3GPP TS 37.571-5 [5]

PosSystem_Load_Scenario: Basic Type Definitions

TTCN-3 Basic Types		
ScenarioNumber_Type	integer	

PositioningScenario_Type

TTCN-3 Union Type		
Name	**PositioningScenario_Type**	
Comment		
LTE_Positioning	ScenarioNumber_Type	Reference to 3GPP TS 37.571-5 [5]
AGNSS	ScenarioNumber_Type	Reference to 3GPP TS 37.571-5 [5]
V2X	ScenarioNumber_Type	V2X Reference to 3GPP TS 36.508 [7] clause 4.11
NR_Positioning	ScenarioNumber_Type	Reference to 3GPP TS 37.571-5 [5]
Aerial	ScenarioNumber_Type	Reference to 3GPP TS 36.508 [7] clause 4.12
NR_Sidelink	ScenarioNumber_Type	Reference to 3GPP TS 38.508-1 [30] clause 4.11

D.1.2   PosSystem_Retrieve_Data

D.1.2.1   SatSystem_Retrieve_UTRAN_Data

UTRAN_GPS_AssistanceDataRequest_Type

TTCN-3 Record Type			
Name	**UTRAN_GPS_AssistanceDataRequest_Type**		
Comment			
AssistanceData ReqGPS	bitstring		bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AdditionalAssistanceDataRequest

UTRAN_GANSS_AssistanceDataRequest_Type

TTCN-3 Record Type			
Name	**UTRAN_GANSS_AssistanceDataRequest_Type**		
Comment			
AssistanceData ReqGANSS	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest
AssistanceData ReqGANSSv86 0ext	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest-v860ext
AssistanceData ReqGANSSvc5 0ext	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest-vc50ext

UTRAN_AssistanceDataRequest_Type

TTCN-3 Union Type		
Name	**UTRAN_AssistanceDataRequest_Type**	
Comment		
GPS	UTRAN_GPS_AssistanceDataRequest_Type	
GANSS	UTRAN_GANSS_AssistanceDataRequest_Type	

UTRAN_AssistanceDataRequestList_Type

TTCN-3 Record of Type	
Name	**UTRAN_AssistanceDataRequestList_Type**
Comment	
record length(1..tsc_MaxPosSystems) of UTRAN_AssistanceDataRequest_Type	

UTRAN_GPS_AssistanceData_Type

TTCN-3 Record Type			
Name	UTRAN_GPS_AssistanceData_Type		
Comment	The returned Almanac information is split into two fields: Almanac for satellites 1 to 16 in AssistanceDataGPSr7 together with other information; Almanac for satellites 17 to 31: in 'almanacSat17To31'		
AssistanceData GPSr7	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AssistanceData-r7
AssistanceData GPSr12	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AssistanceData-r12
AlmanacSatInf oList17To31	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type AlmanacSatInfoList

UTRAN_GANSS_AssistanceData_Type

TTCN-3 Record Type			
Name	UTRAN_GANSS_AssistanceData_Type		
Comment			
AssistanceData GANSS_r8	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AssistanceData-r8
AssistanceData GANSS_r12	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AssistanceData-r12

UTRAN_AssistanceData_Type

TTCN-3 Union Type		
Name	UTRAN_AssistanceData_Type	
Comment		
GPS	UTRAN_GPS_AssistanceData_Type	
GANSS	UTRAN_GANSS_AssistanceData_Type	

UTRAN_AssistanceDataList_Type

TTCN-3 Record of Type	
Name	UTRAN_AssistanceDataList_Type
Comment	
record length(1..tsc_MaxPosSystems) of UTRAN_AssistanceData_Type	

D.1.2.2 PosSystem_Retrieve_LPP_Data

When data is to be requested for more than one positioning system, they will be included into one single template. This template will include a list with one element for each positioning system.
See template "cs_RequestAssistData_UEB_GpsAndGlonass" as an example.

LPP_AssistanceDataRequest_Type

TTCN-3 Union Type		
Name	LPP_AssistanceDataRequest_Type	
Comment		
LPP_Assistanc eData	bitstring	bitstring containing 3GPP TS 37.355 [10] type RequestAssistanceData-r9-IEs

LPP_AssistanceDataProvide_Type

TTCN-3 Union Type		
Name	**LPP_AssistanceDataProvide_Type**	
Comment		
LPP_Assistanc eData	bitstring	bitstring containing 3GPP TS 37.355 [10] type ProvideAssistanceData-r9-IEs

LPP_AssistanceDataRequestList_Type

TTCN-3 Record of Type	
Name	**LPP_AssistanceDataRequestList_Type**
Comment	
record length(1..tsc_MaxPosSystems) of LPP_AssistanceDataRequest_Type	

LPP_AssistanceDataList_Type

TTCN-3 Record of Type	
Name	**LPP_AssistanceDataList_Type**
Comment	
record length(1..tsc_MaxPosSystems) of LPP_AssistanceDataProvide_Type	

D.1.2.3 PosSystem_Retrieve_Data_Common

AssistanceDataRetrieveRequest_Type

TTCN-3 Union Type		
Name	**AssistanceDataRetrieveRequest_Type**	
Comment		
LPP	LPP_AssistanceDataRequestList _Type	LTE/NR positioning
UTRA_GNSS	UTRAN_AssistanceDataRequest List_Type	Retrieve A-GNSS data list in the order of positioning system provided in PositioningSystemList

AssistanceDataRetrieveResponse_Type

TTCN-3 Union Type		
Name	**AssistanceDataRetrieveResponse_Type**	
Comment		
LPP	LPP_AssistanceDataList_Type	LTE/NR positioning
UTRA_AGNSS	UTRAN_AssistanceDataList_Typ e	Retrieve A-GNSS data list in the order of positioning system provided in PositioningSystemList

D.1.3 PosSystem_PowerControl

PowerControl_Type

TTCN-3 Union Type		
Name	**PowerControl_Type**	
Comment	V2X. The GNSS simulator is switched on/off without stopping the UTC time sequence	
PowerOn	Null_Type	By default the power is on in the GNSS simulator
PowerOff	Null_Type	

D.1.4　PosSystem_GnssUtcTime

GnssUtcTime_Type

TTCN-3 Record Type			
Name	**GnssUtcTime_Type**		
Comment			
Struct_tm	Struct_tm_Type		Local GNSS time
TimezoneInfo	integer		Difference (in seconds) between the UTC time (GMT) and the local time

D.1.5　System_Interface

Common ASP definitions

PosSystemCrtlRequest_Type

TTCN-3 Union Type			
Name	**PosSystemCrtlRequest_Type**		
Comment			
Start	Null_Type		
Stop	Null_Type		
LoadScenario	PositioningScenario_Type		
RetrieveData	AssistanceDataRetrieveRequest_Type		
TriggerMove	Null_Type		V2X. Start moving to the next area/zone in the scenario
TriggerPowerOnOff	PowerControl_Type		V2X. Switch on/off the transmitter without stopping UTC time sequence
SetAltitude	Altitude_Type		Aerial Set the height above the sea level to the provided value
TriggerAerialMove	Altitude_Type		Aerial Start moving towards target height
RetrieveGnssUtcTime	Null_Type		Get current UTC time of the GNSS scenario. This can only be used once a GNSS scenario has been loaded and started

PosSystemCrtlConfirm_Type

TTCN-3 Union Type			
Name	**PosSystemCrtlConfirm_Type**		
Comment	In general, to be sent after the configuration has been done		
Start	Null_Type		
Stop	Null_Type		
LoadScenario	Null_Type		
RetrieveData	AssistanceDataRetrieveResponse_Type		
TriggerMove	Null_Type		V2X
TriggerPowerOnOff	Null_Type		V2X
SetAltitude	Null_Type		Aerial
TriggerAerialMove	Null_Type		Aerial
RetrieveGnssUtcTime	GnssUtcTime_Type		

POS_SYSTEM_CTRL_REQ

TTCN-3 Record Type			
Name	**POS_SYSTEM_CTRL_REQ**		
Comment			
PositioningSystemList	PositioningSystemList_Type		The list of positioning systems to be configured; there is only one system of one type in the list e.g. gps, galileo etc.
CnfFlag	boolean		true => SS shall send CNF
Request	PosSystemCrtlRequest_Type		

POS_SYSTEM_CTRL_CNF

TTCN-3 Record Type			
Name	**POS_SYSTEM_CTRL_CNF**		
Comment			
PositioningSystemList	PositioningSystemList_Type		
Confirm	PosSystemCrtlConfirm_Type		

POS_MTC_SYSTEM_PORT

TTCN-3 Port Type		
Name	**POS_MTC_SYSTEM_PORT**	
Comment	Positioning: port at the MTC to be mapped to the system	
out	POS_SYSTEM_CTRL_REQ	
in	POS_SYSTEM_CTRL_CNF	

POS_MTC_PTC_PORT

TTCN-3 Port Type		
Name	**POS_MTC_PTC_PORT**	
Comment	Positioning: port at the MTC to hand over information from the positioning system to the PTC(s)	
out	POS_SYSTEM_CTRL_CNF	
in	POS_SYSTEM_CTRL_REQ	

POS_PTC_MTC_PORT

TTCN-3 Port Type		
Name	**POS_PTC_MTC_PORT**	
Comment	Positioning: port at the PTC(s) to send commands to the positioning system via the MTC	
out	POS_SYSTEM_CTRL_REQ	
in	POS_SYSTEM_CTRL_CNF	

D.2 CommonDefs

CommonDefs: Basic Type Definitions

TTCN-3 Basic Types		
Null_Type	boolean (true)	dummy type for 'typeless' fields in unions

Struct_tm_Type

TTCN-3 Record Type				
Name	**Struct_tm_Type**			
Comment	TTCN-3 equivalent for the "struct tm" as defined on C standard library (time.h or ctime.h for C or C++)			
tm_sec	integer		seconds after the minute 0..61 (tm_sec is generally 0-59. Extra range to accommodate for leap seconds in certain systems)	
tm_min	integer		minutes after the hour 0..59	
tm_hour	integer		hours since midnight 0..23	
tm_mday	integer		day of the month 1..31	
tm_mon	integer		months since January 0..11	
tm_year	integer		years since 1900	
tm_wday	integer		days since Sunday 0..6	
tm_yday	integer		days since January 1 0..365	
tm_isdst	integer		Daylight Saving Time flag	

D.3   References to TTCN-3

References to TTCN-3		
PosSystem_ASP_TypeDefs	POS/PosSystem_ASP_TypeDefs.ttcn	Rev 32599
CommonDefs	Common/CommonDefs.ttcn	Rev 32608

Annex E (informative)
TTCN-3 Definitions

E.1   NR5GC_POS_ASP_TypeDefs

Type definitions for configuration of DL Positioning Reference Signal in the system simulator;
Common design principles: refer to 3GPP TS 38.523-3 [24] annex D.

E.1.1   NR_System_Configuration_PosExt

Formal ASP Definitions for NR5GC DL-PRS system configuration

NR_SystemRequest_PosExt_Type

TTCN-3 Union Type		
Name	**NR_SystemRequest_PosExt_Type**	
Comment	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D	
Cell	NR_CellConfigRequest_PosExt_Type	configure DL-PRS in an NR cell; the cell shall be configured as usual beforehand and SS shall raise an error when the cell does not exist yet; there is no explicit release of the PRS but the whole cell needs to be released

NR_SystemConfirm_PosExt_Type

TTCN-3 Union Type		
Name	**NR_SystemConfirm_PosExt_Type**	
Comment	confirmations for system configuration; in general to be sent after the configuration has been done	
Cell	Null_Type	(no further parameters from SS)

E.1.2   NR_Cell_Configuration_PosExt

Specific Info for DL-PRS Cell Configuration Primitive

E.1.2.1   NR_Cell_Configuration_Common_PosExt

NR_CellConfigRequest_PosExt_Type

TTCN-3 Union Type		
Name	**NR_CellConfigRequest_PosExt_Type**	
Comment	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D	
AddOrReconfigure	NR_CellConfigInfo_PosExt_Type	for PRS configuration of given cell: CellId : identifier of the cell to be configured RoutingInfo : None RlcBearerRouting : 'None' MacBearerRouting : 'omit' TimingInfo : Now (for initial configuration and for reconfiguration in general) ControlInfo : CnfFlag:=true; FollowOnFlag:=false (in general)

NR_CellConfigInfo_PosExt_Type

TTCN-3 Record Type			
Name	**NR_CellConfigInfo_PosExt_Type**		
Comment	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D common information for initial cell configuration or reconfiguration; in case of reconfiguration OMIT means 'keep configuration as it is'		
PhysicalLayer	NR_CellConfigPhysicalLayer_PosExt_Type	opt	Extended DL-PRS information for a cell

NR_CellConfigPhysicalLayer_PosExt_Type

TTCN-3 Record Type			
Name	**NR_CellConfigPhysicalLayer_PosExt_Type**		
Comment	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D Physical layer:		
Downlink	NR_CellConfigPhysicalLayerDownlink_PosExt_Type	opt	Default settings regarding physical control DL-PRS signal

E.1.2.2   Downlink_Physical_Layer_Configuration_PosExt

Downlink physical layer configuration:
- DL-PRS Frequency Layer configuration.
- DL-PRS TRP configuration.

Downlink_Physical_Layer_Configuration_PosExt: Basic Type Definitions

TTCN-3 Basic Types		
DlPrs_CombSizeN_Type	NR_DL_PRS_PositioningFrequencyLayer_r16.dl_PRS_CombSizeN_r16	

DlPrs_FreqLayerConfig_Type

TTCN-3 Record Type			
Name	**DlPrs_FreqLayerConfig_Type**		
Comment			
DlPrs_ResourceBW	integer	opt	
DlPrs_CombSizeN	DlPrs_CombSizeN_Type	opt	

DlPrs_TRPConfig_Type

TTCN-3 Record Type			
Name	**DlPrs_TRPConfig_Type**		
Comment			
NrDlPrsSfn0Offset	NR_DL_PRS_SFN0_Offset_r16	opt	
NrDlPrsExpectedRstd	integer	opt	
NrDlPrsExpectedRstdUncertainty	integer	opt	
NrDlPrsInfo	NR_DL_PRS_Info_r16	opt	

DlPrs_EPREs_Type

TTCN-3 Record Type			
Name	**DlPrs_EPREs_Type**		
Comment	EPRE for DL-PRS relative to SSS		
DlPrsToSSS	NR_EPRE_Ratio_Type	opt	Positioning reference signal; 38.211 clause 7.4.1.7

DL_PRSConfig_Type

TTCN-3 Record Type			
Name	**DL_PRSConfig_Type**		
Comment	to configure DL-PRS for positioning; all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
DlPrs_FreqLayerConfig	DlPrs_FreqLayerConfig_Type	opt	
DlPrs_TRPConfig	DlPrs_TRPConfig_Type	opt	
RelativeTxPower	DlPrs_EPREs_Type	opt	transmit power for DL-PRS signal

NR_CellConfigPhysicalLayerDownlink_PosExt_Type

TTCN-3 Record Type			
Name	**NR_CellConfigPhysicalLayerDownlink_PosExt_Type**		
Comment	all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
DL_PRSConfig	DL_PRSConfig_Type	opt	

E.1.3 NR_System_Interface_PosExt

NR_SYSTEM_CTRL_POSEXT_REQ

TTCN-3 Record Type			
Name	**NR_SYSTEM_CTRL_POSEXT_REQ**		
Comment			
Common	NR_ReqAspCommonPart_Type		For configuration of DL-PRS TimingInfo is now
Request	NR_SystemRequest_PosExt_Type		configure a DL-PRS in a cell

NR_SYSTEM_CTRL_POSEXT_CNF

TTCN-3 Record Type			
Name	**NR_SYSTEM_CTRL_POSEXT_CNF**		
Comment			
Common	NR_CnfAspCommonPart_Type		TimingInfo is ignored by TTCN => SS may set TimingInfo to "None"
Confirm	NR_SystemConfirm_PosExt_Type		

NR_SYSTEM_POSEXT_PORT

TTCN-3 Port Type	
Name	**NR_SYSTEM_POSEXT_PORT**
Comment	NR PTC: Ext Port for system configuration of DL-PRS
out	NR_SYSTEM_CTRL_POSEXT_REQ
in	NR_SYSTEM_CTRL_POSEXT_CNF

E.2 References to TTCN-3

References to TTCN-3		
NR5GC_POS_ASP_TypeDefs	NR5GC/NR5GC_POS_ASP_TypeDefs.ttcn	Rev 36621

Annex F (informative):
Change history

Change history							
Date	TSG #	TSG Doc.	CR	R e v	Subject/Comment	Old	New
2011-06	RAN5#51	R5-112203	-	-	Initial proposal for A-GNSS		0.0.1
2011-09	RAN5#52	R5-113037	-	-	Introduced positioning test model	0.0.1	0.1.0
2011-11	RAN5#53	R5-115106	-	-	Imported A-GPS test model from 3GPP TS 34.123-3	0.1.0	1.0.0
2011-12	RAN#54	RP-111627	-	-	Presentation of V1.0.0	0.1.0	1.0.0
2012-05	RAN5#55	R5-121083	-	-	Presentation of V1.1.0	1.0.0	1.1.0
2012-06	RAN#56	RP-120614	-	-	Presentation of V2.0.0	1.0.0	2.0.0
2012-06	RAN#56		-	-	Editorial corrections and formattings.	2.0.0	9.0.0
2012-06	RAN#56		-	-	Raised to v10.0.0 with no change.	9.0.0	10.0.0
2012-09	RAN#57	R5-123690	0001	-	37571-4: Routine maintenance and updates	10.0.0	10.1.0
2013-06	RAN#60	R5-131136	0003	-	37571-4: Routine maintenance and updates	10.1.0	10.2.0
2013-06	RAN#60	R5s130125	0004	-	Addition of EUTRA UE Positioning test case 7.1.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130145	0005	-	Addition of EUTRA UE Positioning test case 7.3.1.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130147	0006	-	Addition of EUTRA UE Positioning test case 7.3.2.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130149	0007	-	Addition of EUTRA UE Positioning test case 7.3.2.2	10.1.0	10.2.0
2013-06	RAN#60	R5s130151	0008	-	Addition of EUTRA UE Positioning test case 7.3.2.3	10.1.0	10.2.0
2013-06	RAN#60	R5s130153	0009	-	Addition of EUTRA UE Positioning test case 7.3.5.1_6s	10.1.0	10.2.0
2013-06	RAN#60	R5s130155	0010	-	Addition of EUTRA UE Positioning test case 7.3.5.1_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130157	0011	-	Addition of EUTRA UE Positioning test case 7.3.4.2_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130159	0012	-	Addition of EUTRA UE Positioning test case 7.3.4.2_6s	10.1.0	10.2.0
2013-06	RAN#60	R5s130288	0013	-	Addition of EUTRA UE Positioning test case 7.3.4.4_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130290	0014	-	Addition of EUTRA UE Positioning test case 7.3.5.1_1s	10.1.0	10.2.0
2013-06	RAN#60	RP-130616	0015	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.1.0	10.2.0
2013-09	RAN#61	R5s130421	0016	-	Correction to EUTRA UE Positioning test cases 7.3.4.2.5s and 7.3.4.4.5s	10.2.0	10.3.0
2013-09	RAN#61	R5s130457	0017	-	Correction to EUTRA UE Positioning test case 7.3.5.1.1s	10.2.0	10.3.0
2013-09	RAN#61	R5s130468	0018	-	Correction to EUTRA UE Positioning test cases 7.3.1.1	10.2.0	10.3.0
2013-09	RAN#61	RP-131167	0019	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.2.0	10.3.0
2013-12	RAN#62	R5s130618	0020	-	Addition of EUTRA UE Positioning test case 7.3.4.1_1s	10.3.0	10.4.0
2013-12	RAN#62	R5s130627	0021	-	Addition of EUTRA UE Positioning test case 7.3.4.3_1s	10.3.0	10.4.0
2013-12	RAN#62	RP-131871	0022	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.3.0	10.4.0
2014-03	RAN#63	R5-140326	0023	-	A-GNSS ASN.1 reference	10.4.0	10.5.0
2014-03	RAN#63	R5s130913	0024	-	Correction to function fl_TC_7_3_5_1_GNSS_TestBody	10.4.0	10.5.0
2014-03	RAN#63	R5s130914	0025	-	Correction to svID values in AcquisitionAssist and AuxiliaryInformation	10.4.0	10.5.0
2014-03	RAN#63	R5s131009	0026	-	Addition of EUTRA UE Positioning test case 7.3.5.1_2s	10.4.0	10.5.0
2014-03	RAN#63	R5s131011	0027	-	Addition of EUTRA UE Positioning test case 7.3.5.1_4s	10.4.0	10.5.0
2014-03	RAN#63	RP-140316	0028	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.4.0	10.5.0
2014-06	RAN#64	R5s140086	0029	-	Addition of EUTRA UE Positioning test case 7.2.1.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140088	0030	-	Addition of EUTRA UE Positioning test case 7.2.1.2	10.5.0	10.6.0

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-06	RAN#64	R5s140090	0031	-	Addition of EUTRA UE Positioning test case 7.2.1.3	10.5.0	10.6.0
2014-06	RAN#64	R5s140242	0032	-	Correction to LTE UE Positioning test case 7.3.5.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140253	0033	-	Addition of EUTRA UE Positioning test case 7.3.4.4.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140255	0034	-	Addition of EUTRA UE Positioning test case 7.3.4.2.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140257	0035	-	Correction to LTE UE Positioning test case 7.3.4.3.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140316	0036	-	Addition of UTRAN UE Positioning test case 6.2.3.3	10.5.0	10.6.0
2014-06	RAN#64	R5s140318	0037	-	Addition of UTRAN UE Positioning test case 6.2.3.4	10.5.0	10.6.0
2014-06	RAN#64	R5s140320	0038	-	Addition of UTRAN UE Positioning test case 6.2.3.5	10.5.0	10.6.0
2014-06	RAN#64	R5s140433	0039	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.3.4s	10.5.0	10.6.0
2014-06	RAN#64	R5s140435	0040	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.4s	10.5.0	10.6.0
2014-06	RAN#64	RP-140825	0041	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.5.0	10.6.0
2014-06	RAN#64	R5s140086	0029	-	Addition of EUTRA UE Positioning test case 7.2.1.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140088	0030	-	Addition of EUTRA UE Positioning test case 7.2.1.2	10.5.0	10.6.0
2014-06	RAN#64	R5s140090	0031	-	Addition of EUTRA UE Positioning test case 7.2.1.3	10.5.0	10.6.0
2014-09	RAN#65	R5-144256	0042	-	Routine maintenance and updates	10.6.0	10.7.0
2014-12	RAN#66	R5s140739	0043	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.2.4s	10.7.0	10.8.0
2014-12	RAN#66	R5s140777	0044	-	Usage of <MULTIPLE_CNF> in UpperTesterFunctions	10.7.0	10.8.0
2014-12	RAN#66	RP-142067	0045	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.7.0	10.8.0
2015-03	RAN#67	R5s141359	0047	-	Correction of errors in implementation of positioning CRs	10.8.0	10.9.0
2015-03	RAN#67	R5s150027	0048	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.1.4s	10.8.0	10.9.0
2015-03	RAN#67	RP-150336	0049	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.8.0	10.9.0
2015-03	RAN#67	-	-	-	upgraded to Rel-11 with no change	10.9.0	11.0.0
2015-03	RAN#67	R5-150735	0046	-	Addition of BeiDou Test Model	11.0.0	12.0.0
2015-06	RAN#68	RP-150897	0050	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.0.0	12.1.0
2015-06	RAN#68	R5s150013	0051	-	Addition of UTRAN UE Positioning test case 6.2.3.2.4s	12.0.0	12.1.0
2015-06	RAN#68	R5s150222	0052	-	Correction to POS ATS in TTCN-3 delivery 15wk10	12.0.0	12.1.0
2015-06	RAN#68	R5s150331	0053	-	Rel-12 baseline upgrade for POS Test Suite	12.0.0	12.1.0
2015-06	RAN#68	R5s150343	0054	-	Corrections to UTRAN UE Positioning functions	12.0.0	12.1.0
2015-06	RAN#68	R5s150344	0055	-	Correction to LTE UE Positioning test cases 7.3.5.1.5s and 7.5.1	12.0.0	12.1.0
2015-06	RAN#68	R5s150345	0056	-	Correction to GLONASS LPP test cases	12.0.0	12.1.0
2015-06	RAN#68	R5s150353	0057	-	Improvement of function f_POS_CheckGnssSupportList	12.0.0	12.1.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2015-06	RAN#68	R5s150404	0058	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.3.1	12.0.0	12.1.0
2015-06	RAN#68	R5s150439	0059	-	Correction to selection of Assistance Data for sub-test 4	12.0.0	12.1.0
2015-09	RAN#69	RP-151421	0060	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.1.0	12.2.0
2015-09	RAN#69	R5s150011	0061	-	Addition of UTRAN UE Positioning test case 6.2.1.1.4s	12.1.0	12.2.0
2015-09	RAN#69	R5s150589	0062	-	Correction to EUTRA Positioning functions	12.1.0	12.2.0
2015-09	RAN#69	R5s150590	0063	-	Correction to Upper Tester modules	12.1.0	12.2.0
2015-09	RAN#69	R5s150706	0064	-	Addition of UTRAN UE Positioning test case 6.2.2.1.4s	12.1.0	12.2.0
2015-09	RAN#69	R5s150708	0065	-	Addition of UTRAN UE Positioning test case 6.2.2.3.4s	12.1.0	12.2.0
2015-09	RAN#69	-	-	-	update of the "non-specific references" in section 2 according to the approved R5-153582 and an action point on ETSI MCC	12.1.0	12.2.0
2015-12	RAN#70	R5s150710	0068	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.2.7s	12.2.0	12.3.0
2015-12	RAN#70	R5s150712	0069	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.7s	12.2.0	12.3.0
2015-12	RAN#70	R5s150805	0070	-	Correction to POS capability check procedure	12.2.0	12.3.0
2015-12	RAN#70	R5s150911	0071	-	Code improvements in Positioning test cases	12.2.0	12.3.0
2015-12	RAN#70	RP-151697	0072	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.2.0	12.3.0
2016-03	RAN#71	R5s151010	0073	-	Correction to POS type definition in ATS_15wk38	12.3.0	12.4.0
2016-06	RAN#72	R5s160479	0074	1	Correction to LTE Positioning test cases	12.4.0	12.5.0
2016-06	RAN#72	R5s160480	0075	1	Correction to UTRA Positioning test cases	12.4.0	12.5.0
2016-09	RAN#73	R5s160713	0076	-	Rel-13 baseline upgrade for POS Test Suite	12.5.0	13.0.0
2016-12	RAN#74	-	-	-	updated to deliver latest TTCN	13.0.0	13.1.0
2017-03	RAN#75	R5-171531	0082	-	Indoor Positioning: Introduction of Test Model	13.1.0	13.2.0
2017-03	RAN#75	R5s170127	0078	1	Correction to GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.7s	13.1.0	13.2.0
2017-03	RAN#75	R5s170128	0079	1	Correction to function f_POS_CheckCapabilities() for OTDOA	13.1.0	13.2.0
2017-03	RAN#75	R5s170186/ RP-170104	0084	-	Update ASP changes due to inclusion of iPOS in 37.571-4 (prose), Annex D	13.1.0	13.2.0
2017-06	RAN#76	R5s170311	0085	-	Addition of LTE UE Positioning test case 7.3.4.1.10s	13.2.0	13.3.0
2017-06	RAN#76	R5s170313	0086	-	Addition of LTE UE Positioning test case 7.3.4.3.10s	13.2.0	13.3.0
2017-06	RAN#76	R5s170363	0087	-	Aligning name of PICS used in TTCN to the TS 37.571-3 definition	13.2.0	13.3.0
2017-06	RAN#76	R5s170383	0083	1	Corrections to UE Positioning test cases	13.2.0	13.3.0
2017-06	RAN#76	R5s170416	0088	-	Update of TC list in 37.571-4 (prose), Annex A, due to merging of GNSS subtest	13.2.0	13.3.0
2017-09	RAN#77	R5s170630	0089	1	Correction to function 'f_POS_CheckGnssSupportList'	13.3.0	13.4.0
2017-09	RAN#77	R5s170599	0090		Rel-14 baseline upgrade for POS Test Suite	13.4.0	14.0.0
2017-09	RAN#77	R5-173663	0091	-	Indoor Positioning Enhancements: Introduction of Test Model	13.4.0	14.0.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2017-12	RAN#78	R5-176982	0093	1	GNSS Test Model updates for V2X	14.0.0	14.1.0
2017-12	RAN#78	R5s170860	0092	1	Correction to UE Positioning test case 7.3.1.1	14.0.0	14.1.0
2018-03	RAN#79	R5-180677	0099	-	Routine maintenance for TS 37.571-4	14.1.0	14.2.0
2018-03	RAN#79	R5s180081	0094	1	Correction to EUTRA release information for UE Positioning TCs	14.1.0	14.2.0
2018-03	RAN#79	R5s180113	0095	1	Addition of LTE UE Positioning test case 7.3.4.2.15s (BDS)	14.1.0	14.2.0
2018-03	RAN#79	R5s180114	0096	1	Addition of LTE UE Positioning test case 7.3.4.4.15s (BDS)	14.1.0	14.2.0
2018-03	RAN#79	R5s180115	0097	1	Addition of LTE UE Positioning test case 7.3.5.1.15s (BDS)	14.1.0	14.2.0
2018-06	RAN#80	R5-182292	0102	-	V2X: Test Model updates	14.2.0	14.3.0
2018-06	RAN#80	R5s180327	0101	1	Correction / improvement to UE Positioning TCs 7.2.2.1 + 7.2.2.2	14.2.0	14.3.0
2018-12	RAN#82	R5s180569	0105	-	Correction to number of almanac elements for Galileo	14.3.0	14.4.0
2018-12	RAN#82	R5s180554	0103	-	Rel-15 Sep'18 baseline upgrade for POS Test Suite	14.4.0	15.0.0
2019-03	RAN#83	R5s190056	0106	-	Correction to checking LPP ePDU capabilities	15.0.0	15.1.0
2019-09	RAN#85	R5-197174	0111	1	UE Positioning over NR: Initial Test Model	15.1.0	15.2.0
2019-09	RAN#85	R5s190462	0109	-	Correction to f_POS_CheckCapabilities_Agnss	15.1.0	15.2.0
2019-09	RAN#85	R5s190463	0110	-	Correction to f_POS_CheckGnssSupportList	15.1.0	15.2.0
2019-09	RAN#85	R5s190759	0112	-	Rel-15 Jun'19 partial baseline upgrade for POS TTCN-3 Test Suite	15.1.0	15.2.0
2019-12	RAN#86	R5-198140	0113	-	Aerial Vehicles: Test Model addition	15.2.0	15.3.0
2019-12	RAN#86	R5-198142	0114	-	UE Positioning over NR: Test Model updates	15.2.0	15.3.0
2019-12	RAN#86	R5-198156	0115	-	Routine maintenance for TS 37.571-4	15.2.0	15.3.0
2019-12	RAN#86	R5s191048	0116	-	Correction to the initialisation function for LTE Positioning test cases	15.2.0	15.3.0
2020-03	RAN#87	R5-200261	0118	-	Routine maintenance for TS 37.571-4	15.3.0	15.4.0
2020-03	RAN#87	R5-200262	0119	-	Editorial changes to TS 37.571-X titles to remove references to individual RATs	15.3.0	15.4.0
2020-06	RAN#88	R5s200581	0120	-	Correction to f_POS_CheckGnssSupportList	15.4.0	15.5.0
2020-12	RAN#90	R5s201391	0122	-	Addition of 5G UE Positioning test case 9.3.1.1	15.5.0	15.6.0
2020-12	RAN#90	R5s201393	0123	-	Addition of 5G UE Positioning test case 9.3.1.2.15s	15.5.0	15.6.0
2020-12	RAN#90	R5s201395	0124	-	Addition of 5G UE Positioning test case 9.3.2.1	15.5.0	15.6.0
2020-12	RAN#90	R5s201397	0125	-	Addition of 5G UE Positioning test case 9.3.2.2	15.5.0	15.6.0
2020-12	RAN#90	R5s201399	0126	-	Addition of 5G UE Positioning test case 9.3.2.3	15.5.0	15.6.0
2020-12	RAN#90	R5s201401	0127	-	Addition of 5G UE Positioning test case 9.3.4.1.15s	15.5.0	15.6.0
2020-12	RAN#90	R5s201403	0128	-	Addition of 5G UE Positioning test case 9.3.4.2.15s	15.5.0	15.6.0
2020-12	RAN#90	R5s201405	0129	-	Addition of 5G UE Positioning test case 9.3.4.3.15s	15.5.0	15.6.0
2020-12	RAN#90	R5s201407	0130	-	Addition of 5G UE Positioning test case 9.3.4.4.15s	15.5.0	15.6.0
2020-12	RAN#90	R5s201460	0131	-	Correction to several NR5GC UE Positioning Test related functions	15.5.0	15.6.0
2020-12	RAN#90	R5s201529	0132	-	Correction to function f_POS_NR_SendLppAck()	15.5.0	15.6.0

					Change history		
Date	**TSG #**	**TSG Doc.**	**CR**	**R e v**	**Subject/Comment**	**Old**	**New**
2020-12	RAN#90	R5s201649	0134	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	15.5.0	15.6.0
2020-12	RAN#90	R5s201388	0121	-	Rel-16 Sep'20 baseline upgrade for POS Test Suite	15.6.0	16.0.0
2021-03	RAN#91	R5s210208	0133	1	Correction to function f_POS_NR_CheckAgnssMultiFreq	16.0.0	16.1.0
2021-03	RAN#91	R5s210262	0135	1	Correction to a NR5GC UE Positioning related function	16.0.0	16.1.0
2021-06	RAN#92	R5-212285	0138	-	Routine maintenance for TS 37.571-4	16.1.0	16.2.0
2021-06	RAN#92	R5s210416	0136	-	Correction for common POS function f_POS_SelectTemplateReq_IonosphModel()	16.1.0	16.2.0
2021-09	RAN#93	R5-214729	0143	-	Routine maintenance for TS 37.571-4	16.2.0	16.3.0
2021-09	RAN#93	R5s210887	0144	-	Correction to NR5GC Positioning Functions	16.2.0	16.3.0
2021-09	RAN#93	R5s210922	0141	1	Correction for multi frequency GNSS support checking	16.2.0	16.3.0
2021-09	RAN#93	R5s210926	0142	1	Addition of NR5GC Positioning test case 9.3.1.2.5s	16.2.0	16.3.0
2021-09	RAN#93	R5s211177	0145	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	16.2.0	16.3.0
2021-12	RAN#94	R5-216658	0149	-	NR Positioning: Test Model addition	16.3.0	16.4.0
2021-12	RAN#94	R5-217256	0151	-	Include new pixit for the 2012 GNSS scenarios	16.3.0	16.4.0
2021-12	RAN#94	R5s211307	0147	-	Correction to POS_Parameters	16.3.0	16.4.0
2021-12	RAN#94	R5s211515	0148	-	Correction to f_POS_OTDOA_CheckEutraBand	16.3.0	16.4.0
2021-12	RAN#94	R5s211696	0153	-	Add new ASP definitions for NR test model extension in Rel-16	16.3.0	16.4.0
2022-03	RAN#95	R5-220457	0156	-	5G V2X: GNSS Test Model updates for NR sidelink	16.4.0	16.5.0
2022-03	RAN#95	R5s220170	0152	1	Correction to NR5GC_Positioning_Functions for capability check	16.4.0	16.5.0
2022-03	RAN#95	R5s220432	0154	1	Correction to f_POS_NR_CheckCapabilities_NR_Ecid	16.4.0	16.5.0
2022-03	RAN#95	R5s220433	0155	1	Correction to SVIDs for 2012 GNSS scenario	16.4.0	16.5.0
2022-03	RAN#95	R5s220439	0158	-	Update of TTCN type definitions, Annex D	16.4.0	16.5.0
2022-06	RAN#96	R5s220671	0159	-	Correction to f_UT_AT_CheckNotifyLocationRequest	16.5.0	16.6.0
2022-06	RAN#96	R5s220672	0160	-	Correction to f_POS_NR_Set_DlPrsPeriodicityAndOffset_11ms	16.5.0	16.6.0
2022-09	RAN#97	R5s220765	0163	-	Correction to function f_TC_7_3_4_2_7s_EUTRA	16.6.0	16.7.0
2022-09	RAN#97	R5s220799	0164	-	Correction to f_TC_7_3_4_4_7s_EUTRA	16.6.0	16.7.0
2022-09	RAN#97	R5s220900	0162	1	Addition of LTE POS testcase 7.2.2.2.5s	16.6.0	16.7.0
2022-09	RAN#97	R5s221026	0165	-	Rel-16 Mar'22 partial baseline upgrade for POS Test Suite	16.6.0	16.7.0
2022-09	RAN#97	R5s221073	0173	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	16.6.0	16.7.0
2022-12	RAN#98	R5s221296	0166	1	Correction to f_POS_NR_CheckCapabilities_Prs_ProcessingCapabilityBandList	16.7.0	16.8.0
2022-12	RAN#98	R5s221350	0168	1	Addition of POS testcase 9.3.1.2.19s	16.7.0	16.8.0
2022-12	RAN#98	R5s221351	0169	1	Addition of POS testcase 9.3.4.2.19s	16.7.0	16.8.0
2022-12	RAN#98	R5s221352	0170	1	Addition of POS testcase 9.3.4.2.20s	16.7.0	16.8.0
2022-12	RAN#98	R5s221353	0171	1	Addition of POS testcase 9.3.4.2.21s	16.7.0	16.8.0

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Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2022-12	RAN#98	R5s221354	0172	1	Addition of POS testcase 9.3.4.2.22s	16.7.0	16.8.0
2022-12	RAN#98	R5s221363	0175	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	16.7.0	16.8.0
2022-12	RAN#98	R5s221180	0174	-	Rel-17 Sep'22 baseline upgrade for POS Test Suite	16.8.0	17.0.0
2023-03	RAN#99	R5s230101	0178	-	Addition of NR POS testcase 9.3.4.4.21s	17.0.0	17.1.0
2023-03	RAN#99	R5s230205	0176	1	Addition of NR POS testcase 9.3.4.4.19s	17.0.0	17.1.0
2023-03	RAN#99	R5s230206	0177	1	Addition of NR POS testcase 9.3.4.4.20s	17.0.0	17.1.0
2023-03	RAN#99	R5s230260	0179	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	17.0.0	17.1.0
2023-06	RAN#100	R5s230438	0180	-	Addition of LTE POS testcase 7.2.2.2.6.FDDs	17.1.0	17.2.0
2023-06	RAN#100	R5s230440	0181	-	Addition of LTE POS testcase 7.2.2.2.6.TDDs	17.1.0	17.2.0
2023-06	RAN#100	R5s230473	0182	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	17.1.0	17.2.0
2023-09	RAN#101	R5s230498	0183	-	Correction for NR5GC positioning test cases	17.2.0	17.3.0
2023-09	RAN#101	R5s230499	0184	-	Correction for EUTRA positioning test case 7.3.4.4_7s	17.2.0	17.3.0
2023-09	RAN#101	R5s230502	0185	-	Addition of CNF templates in PosSystem_Control	17.2.0	17.3.0
2023-09	RAN#101	R5s230513	0186	-	Correction to f_NR_ConfigUlSrsMultiRTT	17.2.0	17.3.0
2023-09	RAN#101	R5s230595	0187	-	Correction for GNSS 15s test cases	17.2.0	17.3.0
2023-09	RAN#101	R5s230608	0188	-	Correction to svID values in AcquisitionAssist and AuxiliaryInformation for GNSS Scenarios 2020	17.2.0	17.3.0
2023-09	RAN#101	R5s230674	0191	-	Update of TTCN type definitions, Annexes C and E	17.2.0	17.3.0
2023-12	RAN#102	R5s230711	0192	-	Correction for positioning test cases	17.3.0	17.4.0
2023-12	RAN#102	R5s230755	0193	-	Correction for function f_POS_NR_CheckCapabilities_Prs_ProcessingCapabilityBandList()	17.3.0	17.4.0
2023-12	RAN#102	R5s230842	0189	1	Rel-17 June'23 partial baseline upgrade for POS Test Suite	17.3.0	17.4.0
2023-12	RAN#102	R5s230846	0190	1	Corrections on control module for POS Test Suite	17.3.0	17.4.0
2024-03	RAN#103	R5-240553	0198	-	Removal of PIXIT for deprecated signalling GNSS scenarios	17.4.0	17.5.0
2024-03	RAN#103	R5s240144	0195	-	Correction to f_POS_NR_Set_DlPrsAssistanceDataPerTRP	17.4.0	17.5.0
2024-03	RAN#103	R5s240146	0196	-	Addition of NR5GC POS test case 9.3.1.2.21s	17.4.0	17.5.0
2024-03	RAN#103	R5s240160	0197	-	Correction to f_POS_NR_CheckCapabilities	17.4.0	17.5.0
2024-03	RAN#103	R5s240169	0200	-	Addition of NR POS Test case 9.3.1.2.20s	17.4.0	17.5.0
2024-03	RAN#103	R5s240199	0194	1	Correction to function f_POS_NR_CheckCapabilities_NR_Ecid	17.4.0	17.5.0
2024-03	RAN#103	R5s240240	0201	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	17.4.0	17.5.0

History

Document history		
V17.0.0	January 2023	Publication
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