**3GPP TSG-CT1 Meeting #130-eC1-213355**

**Electronic Meeting,20 – 28 May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **27.007** | **CR** | **0731** | **rev** | **-** | **Current version:** | **16.8.0** |  |
|  |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| **Title:**  | Correction to AT Commands for NR V2X |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc16 |  | ***Date:*** | 2021-05-13 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | AT Commands defined in clause 15 are only for LTE D2D SL and LTE V2X SL testing under PC5-only operation. Considering that NR SL conformance testing is already started in RAN5 and NR SL will face the similar issue under PC5-only operation. These AT commands are needed to be extended to cover NR SL testing. |
|  |  |
| ***Summary of change:*** | AT commands defined in clause 15 are extended to support NR V2X tests. |
|  |  |
| ***Consequences if not approved:*** | NR V2X under PC5-only operation can't be tested. |
|  |  |
| ***Clauses affected:*** | 2, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.509 CR 0035, CR 0036  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

**<Start of modified section 1>**

# 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*.

[1] 3GPP TS 22.002: "Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[2] 3GPP TS 22.003: "Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[3] 3GPP TS 22.081: "Line identification supplementary services ‑ Stage 1".

[4] 3GPP TS 22.082: "Call Forwarding (CF) supplementary services ‑ Stage 1".

[5] 3GPP TS 22.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services ‑ Stage 1".

[6] 3GPP TS 22.088: "Call Barring (CB) supplementary services ‑ Stage 1".

[7] 3GPP TS 23.003: "Numbering, addressing and identification".

[8] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3".

[9] GSM MoU SE.13, GSM MoU Permanent Reference Document SE.13: "GSM Mobile Network Codes and Names".

[10] ITU‑T Recommendation E.212: "Identification plan for land mobile stations".

[11] ITU‑T Recommendation T.31: "Asynchronous facsimile DCE control, service class 1".

[12] ITU‑T Recommendation T.32: "Asynchronous facsimile DCE control, service class 2".

[13] ITU‑T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) ‑ Information technology ‑ 7‑bit coded character set for information exchange".

[14] ITU‑T Recommendation V.250: "Serial asynchronous automatic dialling and control".

[15] TIA IS‑99: "Data Services Option Standard for Wideband Spread Spectrum Digital Cellular System".

[16] TIA IS‑135: "800 MHz Cellular Systems, TDMA Services, Async Data and Fax".

[17] PCCA STD‑101 Data Transmission Systems and Equipment: "Serial Asynchronous Automatic Dialling and Control for Character Mode DCE on Wireless Data Services".

[18] 3GPP TS 24.022: "Radio Link Protocol (RLP) for data and telematic services on the Mobile Station ‑ Base Station System (MS ‑ BSS) interface and the Base Station System ‑ Mobile‑services Switching Centre (BSS ‑ MSC) interface".

[19] 3GPP TS 22.030: "Man Machine Interface (MMI) of the Mobile Station (MS)".

[20] 3GPP TS 45.008: "Radio subsystem link control".

[21] 3GPP TS 22.085: "Closed User Group (CUG) supplementary services ‑ Stage 1".

[22] 3GPP TS 22.084: "MultiParty (MPTY) supplementary services ‑ Stage 1".

[23] 3GPP TS 22.090: "Unstructured Supplementary Service Data (USSD) ‑ Stage 1".

[24] 3GPP TS 27.005: "Use of Data Terminal Equipment ‑ Data Circuit terminating Equipment (DTE ‑ DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[25] 3GPP TS 23.038: "Alphabet and language specific information".

[26] 3GPP TS 22.024: "Description of Charge Advice Information (CAI)".

[27] 3GPP TS 22.086: "Advice of Charge (AoC) supplementary services ‑ Stage 1".

[28] 3GPP TS 51.011: "Specification of the Subscriber Identity Module ‑ Mobile Equipment (SIM‑ME) interface".

[29] 3GPP TS 22.034: "High Speed Circuit Switched Data (HSCSD) - Stage 1".

[30] 3GPP TS 22.091: "Explicit Call Transfer (ECT) supplementary service - Stage 1".

[31] 3GPP TS 22.072: "Call Deflection (CD) supplementary service - Stage 1".

[32] ISO/IEC 10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.

[33] 3GPP TS 22.022: "Personalization of GSM Mobile Equipment (ME) Mobile functionality specification".

[34] 3GPP TS 27.060: "General requirements on Mobile Stations (MS) supporting General Packet Radio Bearer Service (GPRS)".

[35] Void.

[36] CCITT Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[37] Void.

[38] 3GPP TS 45.005: "Radio transmission and reception".

[39] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting GPRS and Packet Data Networks (PDN)".

[40] 3GPP TS 23.081: "Line identification supplementary services ‑ Stage 2".

[41] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[42] 3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[43] Infrared Data Association; Specification of Ir Mobile Communications (IrMC).

[44] IrDA Object Exchange Protocol.

[45] 3GPP TS 27.010: "Terminal Equipment to User Equipment (TE-UE) multiplexer protocol User Equipment (UE)".

[46] 3GPP TS 23.107: "Quality of Service, Concept and Architecture".

[47] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2".

[48] Void.

[49] 3GPP TS 43.068: "Voice Group Call service (VGCS) - Stage 2".

[50] 3GPP TS 43.069: "Voice Broadcast Service (VBS) - Stage 2".

[51] Void.

[52] 3GPP TS 44.068: "Voice Group Call service (VGCS) - Stage 3".

[53] 3GPP TS 44.069: "Voice Broadcast Service (VBS) - Stage 3".

[54] 3GPP TS 22.067: "enhanced Multi‑Level Precedence and Pre‑emption service (eMLPP) ‑ Stage 1".

[55] 3GPP TS 42.068: "Voice Group Call service (VGCS) - Stage 1".

[56] 3GPP TS 42.069: "Voice Broadcast Service (VBS) - Stage 1".

[57] Void.

[58] 3GPP TS 22.087: "User-to-User Signalling (UUS) - Stage 1".

[59] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) Application".

[60] ETSI TS 102 221 "Smart Cards; UICC-Terminal interface; Physical and logical characteristics (Release 1999)".

[61] 3GPP TS 44.065: "Mobile Station (MS) – Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[62] 3GPP TS 25.323: "Packet Data Convergence Protocol (PDCP)".

[63] 3GPP TS 23.227 "Applications and User interaction in the UE-Principles and specific requirements", Release 5.

[64] Void.

[65] 3GPP TS 31.101: "UICC-Terminal Interface; Physical and Logical Characteristics."

[66] ETSI TS 102 310: "Smart Cards; Extensible Authentication Protocol support in the UICC".

[67] Void.

[68] RFC 3748: "Extensible Authentication Protocol (EAP)".

[69] RFC 3629: "UTF-8, a transformation format of ISO 10646".

[70] 3GPP TS 44.318: "Generic Access (GA) to the A/Gb interface; Mobile GA interface layer 3 specification".

[71] 3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[72] 3GPP TS 25.308: "High Speed Downlink Packet Access (HSDPA): Overall Description; Stage 2".

[73] 3GPP TS 25.319: "Enhanced Uplink; Overall Description; Stage 2".

[74] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".

[75] 3GPP TS 24.216: "Communication Continuity Management Object (MO)".

[76] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[77] 3GPP TS 25.305 "User Equipment (UE) positioning in Universal Terrestrial Radio Access Network (UTRAN); Stage 2".

[78] IEC 61162: "Maritime navigation and radio communication equipment and systems – Digital interfaces".

[79] 3GPP TS 44.031: "Location Services (LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC), Radio Resource LCS Protocol (RRLP)".

[80] 3GPP TS 49.031: "Base Station System Application Part, LCS Extension (BSSAP-LE)".

[81] Void.

[82] 3GPP TS 23.401: "GPRS enhancements for E-UTRAN access".

[83] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS)".

[84] Void.

[85] 3GPP TS 23.203: "Policy and charging control architecture".

[86] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[87] 3GPP TS 24.173: "IMS multimedia telephony communication service and supplementary services; Stage 3".

[88] RFC 4291: "IP Version 6 Addressing Architecture".

[89] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)".

[90] 3GPP TS 23.221: "Architectural requirements".

[91] 3GPP TS 24.237: "IP Multimedia Subsystem (IMS) Service Continuity".

[92] 3GPP TS 31.111: "Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)".

[93] 3GPP TS 22.096: "Name identification supplementary services ‑ Stage 1".

[94] 3GPP TS 23.096: "Name identification supplementary services ‑ Stage 2".

[95] 3GPP TS 25.133: "Requirements for support of radio resource management (FDD)".

[96] 3GPP TS 25.123: "Requirements for support of radio resource management (TDD)".

[97] 3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".

[98] 3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[99] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[100] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[101] 3GPP TS 24.341: "Support of SMS over IP networks".

[102] 3GPP TS 24.167: "3GPP IMS Management Object (MO); Stage 3".

[103] IETF STD 5: "Internet Protocol".

[104] IETF STD 51: "The Point-to-Point Protocol (PPP)".

[105] RFC 1144: "Compressing TCP/IP Headers for Low-Speed Serial Links".

[106] RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[107] RFC 2507: "IP Header Compression".

[108] RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed".

[109] 3GPP TS 24.080: "Mobile radio interface Layer 3 supplementary service specification; Formats and coding".

[110] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[111] RFC 3261: "SIP: Session Initiation Protocol".

[112] RFC 3966: "The tel URI for Telephone Numbers".

[113] RFC 3969: "The Internet Assigned Number Authority (IANA) Uniform Resource Identifier (URI) Parameter Registryfor the Session Initiation Protocol (SIP)".

[114] RFC 5341: "The Internet Assigned Number Authority (IANA) tel Uniform Resource Identifier (URI) Parameter Registry".

[115] 3GPP TS 36.355: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP)".

[116] RFC 2141: "URN Syntax".

[117] RFC 3406: "Uniform Resource Names (URN) Namespace Definition Mechanisms".

[118] RFC 5031: "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services".

[119] 3GPP TS 24.607: "Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[120] 3GPP TS 24.608: "Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[121] 3GPP TS 24.654: "Closed User Group (CUG) using IP Multimedia (IM) Core Network (CN) subsystem, Protocol Specification".

[122] RFC 4715: "The Integrated Services Digital Network (ISDN) Subaddress Encoding Type for tel URI".

[123] 3GPP TS 22.093: "Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1".

[124] 3GPP TS 22.094: "Follow Me service description; Stage 1".

[125] 3GPP TS 22.097: "Multiple Subscriber Profile (MSP) Phase 2; Service description; Stage 1".

[126] 3GPP TS 22.135: "Multicall; Service description; Stage 1".

[127] 3GPP TS 24.182: "IP Multimedia Subsystem (IMS) Customized Alerting Tones (CAT); Protocol specification".

[128] 3GPP TS 24.183: "IP Multimedia Subsystem (IMS) Customized Ringing Signal (CRS); Protocol specification".

[129] 3GPP TS 24.239: "Flexible Alerting (FA) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[130] 3GPP TS 24.259: "Personal Network Management (PNM)".

[131] 3GPP TS 24.390: "Unstructured Supplementary Service Data (USSD) using IP Multimedia (IM) Core Network (CN) subsystem IMS".

[132] 3GPP TS 24.604: "Communication Diversion (CDIV) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[133] 3GPP TS 24.605: "Conference (CONF) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[134] 3GPP TS 24.606: "Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[135] 3GPP TS 24.610: "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[136] 3GPP TS 24.611: "Anonymous Communication Rejection (ACR) and Communication Barring (CB) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[137] 3GPP TS 24.615: "Communication Waiting (CW) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol Specification".

[138] 3GPP TS 24.616: "Malicious Communication Identification (MCID) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[139] 3GPP TS 24.629: "Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[140] 3GPP TS 24.642: "Completion of Communications to Busy Subscriber (CCBS) and Completion of Communications by No Reply (CCNR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification".

[141] 3GPP TS 24.647: "Advice Of Charge (AOC) using IP Multimedia (IM) Core Network (CN) subsystem".

[142] 3GPP TS 36.509: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Special conformance testing functions for User Equipment (UE)".

[143] 3GPP TS 25.102: "Multiplexing and channel coding (TDD)".

[144] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".

[145] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description".

[146] 3GPP TS 45.001: "Physical layer on the radio path; General description".

[147] 3GPP TS 22.101: "Service aspects; Service principles".

[148] 3GPP TS 24.090: "Unstructured Supplementary Service Data (USSD); Stage 3".

[149] 3GPP TS 23.682: "Architecture Enhancements to facilitate communications with Packet Data Networks and Applications".

[150] 3GPP TS 36.443: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); M2 Application Protocol (M2AP)".

[151] Wi-Fi Alliance: "Hotspot 2.0 (Release 2) Technical Specification, version 1.0.0", 2014-08-08.

[152] IEEE Std 802.11™-2012: "Information Technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[153] 3GPP TS 24.312: "Access Network Discovery and Selection Function (ANDSF) Management Object (MO)".

[154] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".

[155] RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[156] 3GPP TS 44.018: "GSM/EDGE Radio Resource Control (RRC) protocol".

[157] CEN EN 15722:2015 (April 2015): "Intelligent transport systems - ESafety - ECall minimum set of data".

[158] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[159] 3GPP TS 38.300: "NR; NR and NG-RAN Overall Description".

[160] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[161] 3GPP TS 24.501: "Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[162] 3GPP TS 37.340: "Evolved Universal Terresterial Radio Access (E-UTRA) and NR; Multi-Connectivity; Stage 2".

[163] 3GPP TS 24.196: "Enhanced Calling Name (eCNAM)".

[164] 3GPP TS 22.173: "IP Multimedia Core Network Subsystem (IMS) Multimedia Telephony Service and supplementary services".

[165] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[166] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".

[167] 3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements".

[168] 3GPP TS 24.250: "Protocol for Reliable Data Service between UE and SCEF; Stage 3".

[169] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".

[170] 3GPP TS 22.011: "Service accessibility".

[171] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[172] 3GPP TS 24.486: "Vehicle-to-Everything (V2X) Application Enabler (VAE) layer; Protocol aspects; Stage 3".

[173] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[174] RFC 3339: "Date and Time on the Internet: Timestamps".

[175] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Stage 3".

[176] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[177] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting; Stage 3".

[178] 3GPP TS 38.509: "5GS; Special conformance testing functions for User Equipment".

[179] 3GPP TS 38.215: "NR; Physical layer measurements".

**<End of modified section 1>**

**<Start of modified section 2>**

# 15 Commands for UE test functions

## 15.1 General

This clause defines AT commands that a TE can use to control MT test loop function for UE test loop and UTC time reset as specified in 3GPP TS 36.509 [142].

The UE test loop function provides access to isolated functions of the UE via the radio interface without introducing new physical interfaces just for the reason of conformance testing. The UE test loop function is activated by transmitting the appropriate TC message to the UE. The +CATM command activates and deactivates the UE test mode procedure and sets the UE into test loop mode. The +CCUTLE command opens and closes the UE test loop mode E function in the UE for either transmitting or receiving of V2X communication packets. Only UE test loop mode E is supported by AT commands.

The +CUSPCREQ command requests the UE to report the counter of successful reception of sidelink PSCCH transport blocks, STCH PDCP SDU packets and PSSCH transport blocks.

The +CUTCR command resets the UTC time previously calculated from GNSS in the UE.

The +CCBRREQ command requests the UE to report the channel busy ratio (CBR).

The +CV2XDTS command triggers the UE to start or stop sending V2X data over E-UTRA or NR PC5.

The +CSPSAIR command requests the UE to send E-UTRA or NR UEAssistanceInformation message to request SPS grant from eNB.

## 15.2 Activate test mode +CATM

Table 15.2-1: +CATM parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CATM=[<status>[,<test\_loop\_mode>]] | *+CME ERROR: <err>* |
| +CATM? | +CATM: <status>[,<test\_loop\_mode>] |
| +CATM=? | +CATM: (list of supported <status>s),(list of supported <test\_loop\_mode>s) |

**Description**

The set command is used to activate or deactivate the UE test mode according to UE test mode procedures as defined in 3GPP TS 36.509 [142] subclause 5.3.2 and subclause 5.3.3 for V2X over E-UTRA PC5, and in 3GPP TS 38.509 [178] subclause 5.2.2 and subclause 5.2.3 for V2X over NR PC5. When <status>=1, the set command activates the UE test mode and sets the UE in test loop mode. The parameter <test\_loop\_mode> must be included to indicate the UE test loop mode. When <status>=0, the set command deactivates the UE test mode. Refer subclause 9.2 for possible <err> values.

NOTE: Only UE test loop mode E is supported by AT commands.

The read command returns the current UE test mode activation and UE test loop mode statuses.

The test command returns values supported as compound values.

**Defined values**

<status>: integer type. Indicates the state of UE test mode.

0 deactivated

1 activated

<test\_loop\_mode>: integer type. Indicates the UE test loop mode.

1 UE test loop mode E

**Implementation**

Optional.

## 15.3 Close UE test loop mode E +CCUTLE

Table 15.3-1: +CCUTLE parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CCUTLE=<status>[,<direction>[,<format>,<length>,<monitor\_list>]] | *+CME ERROR: <err>* |
| +CCUTLE? | +CCUTLE: <status>[,<direction>[,<format>,<length>,<monitor\_list>]] |
| +CCUTLE=? | +CCUTLE: (list of supported <status>s),(list of supported <direction>s),(list of supported <format>s)(maximum supported <length>) |

**Description**

The set command is used to close or open the UE test loop mode E according to UE test loop procedures as defined in 3GPP TS 36.509 [142] subclause 5.4.2, subclause 5.4.4c and subclause 5.4.5 for V2X over E-UTRA PC5, and in 3GPP TS 38.509 [178] subclause 5.3.2, subclause 5.3.3 and subclause 5.3.4.3. The AT command is only applicable when test mode is activated, see subclause 15.2. The <status> indicates whether the UE test loop mode E is closed or opened. If <status>=0, the parameters <direction>, <format>, <length> and <monitor\_list> are as required provided to configure UE test loop mode E.

The UE test loop mode E provides means for either transmitting or receiving of V2X communication packets, and the <direction> indicates the direction of communication under test. For communication receive operation, <direction>=0 and the UE test loop mode E provides counting of successfully received STCH PDCP SDUs for V2X over E-UTRA PC5 or STCH SDAP SDUs for V2X over NR PC5, PSCCH transport blocks and PSSCH transport blocks. The parameters <format>, <length> and <monitor\_list> must be provided. For communication transmit operation, <direction>=1 and the UE test loop mode E provides trigger for transmission of IP packets for V2X communication message on STCH. The parameters <format>, <length> and <monitor\_list> are not used and ignored if received. All parameters are discarded when <status>=1 or when the UE test mode is deactivated.

The read command returns the current settings.

The test command returns values supported as compound values.

**Defined values**

<status>: integer type. Indicates the state of UE test loop E.

0 closed

1 opened

<direction>: integer type. Indicates the direction of communication under test.

0 communication receive

1 communication transmit

<format>: integer type. Indicates the format of the <monitor\_list> parameter.

1 binary format

<length>: integer type. Indicates the number of 24 bit Destination Layer-2 IDs in the parameter <monitor\_list>.

<monitor\_list>: string of octets. This parameter contains all 24 bit Destination Layer-2 IDs to monitor for V2X communication. The type of string is in the format as specified by <format>. The number of 24 bit Destination Layer-2 IDs is given by <length>. The parameter shall not be subject to conventional character conversion as per +CSCS.

**Implementation**

Optional.

## 15.4 UE sidelink packet counter request +CUSPCREQ

Table 15.4-1: +CUSPCREQ action command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CUSPCREQ | +CUSPCREQ: [<type1>,<format>,<length1>,<counter1>],[<type2>,<format>,<length2>,<counter2>],[<type3>,<format>,<length3>,<counter3>]*+CME ERROR: <err>* |
| +CUSPCREQ=? |  |

**Description**

The set command is used to request the UE to report the counter of successful reception of sidelink PSCCH transport blocks, STCH PDCP SDU packets and PSSCH transport blocks according to the ProSe Packet Counter reporting procedure as defined in 3GPP TS 36.509 [142] subclause 5.7 for ProSe or V2X over E-UTRA PC5 and/or sidelink PSCCH transport blocks, STCH SDAP SDU packets and/or PSSCH transport blocks according to the ProSe Packet Counter reporting procedure as defined in 3GPP TS 38.509 [178] subclause 5.9 for V2X over NR PC5. The AT command is only applicable when test mode is activated, see subclause 15.2. Refer subclause 9.2 for possible <err> values.

**Defined values**

<type1>: integer type. Indicates the type of V2X communication.

1 E-UTRA PSCCH transport blocks

2 NR PSCCH transport blocks

<type2>: integer type. Indicates the type of V2X communication.

1 E-UTRA STCH PDCP SDU packets

2 NR STCH SDAP SDU packets

<type3>: integer type. Indicates the type of V2X communication.

1 E-UTRA PSSCH transport blocks

2 NR PSSCH transport blocks

<format>: integer type. Indicates the format of the requested packet counter.

1 binary format

<length1>: integer type. Indicates the number of octets of the <counter1> information element.

<length2>: integer type. Indicates the number of octets of the <counter2> information element.

<length3>: integer type. Indicates the number of octets of the <counter3> information element.

<counter1>: string of octets. Indicates the counter value of E-UTRA PSCCH transport blocks when <type1>=1 and of NR PSCCH transport blocks when <type1>=2. The type of string is in the format as specified by <format>. The parameter shall not be subject to conventional character conversion as per +CSCS.

<counter2>: string of octets. Indicates the counter value of E-UTRA STCH PDCP SDU packets when <type2>=1 and of NR STCH SDAP SDU packets when <type2>=2. The type of string is in the format as specified by <format>. The parameter shall not be subject to conventional character conversion as per +CSCS.

<counter3>: string of octets. Indicates the counter value of E-UTRA PSSCH transport blocks when <type3>=1 and of NR PSSCH transport blocks when <type3>=2. The type of string is in the format as specified by <format>. The parameter shall not be subject to conventional character conversion as per +CSCS.

**Implementation**

Optional.

## 15.5 UTC time reset +CUTCR

Table 15.5-1: +CUTCR action command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CUTCR | *+CME ERROR: <err>* |
| +CUTCR=? |  |

**Description**

The set command is used to reset the current UTC time that has been calculated from GNSS in the UE as defined in 3GPP TS 36.509 [142] subclause 5.5.3. This allows the UE to rapidly reaquire GNSS and calculate a new value of UTC time. The UE can optionally retain the information that may aid rapid reaquisition of GNSS and the calculation of a new value of UTC time. The AT command is only applicable when test mode is activated, see subclause 15.2. Refer subclause 9.2 for possible <err> values.

NOTE: This command does not affect functionality provided by other AT commands defined in subclauses other than subclause 15.

**Defined values**

None.

**Implementation**

Optional.

## 15.6 Channel busy ratio request +CCBRREQ

Table 15.6-1: +CCBRREQ action command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CCBRREQ[=<pc5\_type>] | when <pc5\_type>=0 (or omitted) and command successful:+CCBRREQ: <cbr-pssch>[,<cbr-pscch>]when <pc5\_type>=1 and command successful:+CCBRREQ: <nr-cbr>*+CME ERROR: <err>* |
| +CCBRREQ=? |  |

**Description**

The set command is used to request the UE to report the Channel busy ratio (CBR) for V2X communication over E-UTRA PC5 measured as specified in 3GPP TS 36.214 [167] subclause 5.1.30 or over NR PC5 measured as specified in 3GPP TS 38.215 [179] subclause 5.1.27. The AT command is only applicable when test mode is activated, see subclause 15.2. Refer subclause 9.2 for possible <err> values.

**Defined values**

<PC5\_type>: integer type. Indicates the RAT type of PC5 interface.

0 E-UTRA PC5

1 NR PC5

<cbr-pssch>: integer type. Indicates the CBR measured on the PSSCH for V2X communication over E-UTRA PC5. Value 0 corresponds to CBR=0.0, value 1 corresponds to CBR=0.01, value 2 corresponds to CBR=0.02 and so on.

<cbr-pscch>: integer type. Indicates the CBR measured on the E-UTRA PSCCH. Value 0 corresponds to CBR=0.0, value 1 corresponds to CBR=0.01, value 2 corresponds to CBR=0.02 and so on. This parameter is only returned by the UE if the PSSCH and the PSCCH are transmitted in non-adjacent resource blocks as specified in 3GPP TS 36.214 [167] subclause 5.1.30.

<nr-cbr>: integer type. Indicates the CBR measured on the PSSCH for V2X communication over NR PC5. Value 0 corresponds to CBR=0.0, value 1 corresponds to CBR=0.01, value 2 corresponds to CBR=0.02 and so on.

**Implementation**

Optional.

## 15.7 V2X data transmission over PC5 +CV2XDTS

Table 15.7-1: +CV2XDTS parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CV2XDTS=<action>[,<data\_size>,<periodicity>,<pc5\_type>] | *+CME ERROR: <err>* |
| +CV2XDTS? | +CV2XDTS: <action>[,<data\_size>,<periodicity>][,<pc5\_type>] |
| +CV2XDTS=? | +CV2XDTS: (list of supported <action>s)[,(maximum supported <data\_size>),(minimum supported <periodicity>)][,list of supported <pc5\_type> s] |

**Description**

The set command is used to trigger the UE to start or stop sending V2X data over PC5 as defined in 3GPP TS 36.213 [166] subclause 14. The AT command is only applicable when test mode is activated, see subclause 15.2. The <action> indicates whether the UE shall start or stop sending data. If <action>=1, the parameters <data\_size> and <periodicity> must be provided. All parameters are discarded when <action>=0 or when the UE test mode is deactivated.

The read command returns the current settings.

The test command returns values supported as compound values.

**Defined values**

<action>: integer type. Indicates whether the UE shall start or stop sending V2X data over PC5.

0 stop sending data

1 start sending data

<data\_size>: integer type. Indicates how many bytes of data the UE shall send over PC5.

NOTE: The data sent by the UE consists of a random bit string. How it is generated is up to UE implementation.

<periodicity>: integer type. Indicates with which periodicity, in milliseconds, the UE shall transmit the number of bytes indicated in <data\_size>.

<pc5\_type>: integer type. indicates with the RAT type of PC5 over which the UE shall transmit V2X data.

0 E-UTRA PC5

1 NR PC5

**Implementation**

Optional.

## 15.8 SPS assistance information request +CSPSAIR

Table 15.8-1: +CSPSAIR action command syntax

|  |  |
| --- | --- |
| Command | Possible Response(s) |
| +CSPSAIR=<interface> | *+CME ERROR: <err>* |
| +CSPSAIR=? | +CSPSAIR: (list of supported <interface>s) |

**Description**

The set command is used to request the UE to send the UEAssistanceInformation message to request SPS grant from eNB as specified in 3GPP TS 36.331 [86] subclause 5.6.10.2 or from gNB as specified in 3GPP TS 38.331 [160] subclause 5.7.4.2. The set command is only applicable when test mode is activated, see subclause 15.2. When <interface>=0, the UE shall send the UEAssistanceInformation message to request UL SPS grant for V2X communication over LTE-Uu from eNB. When <interface>=1, the UE shall send the UEAssistanceInformation message to request SL SPS grant for V2X communication over E-UTRA PC5 from eNB. When <interface>=2, the UE shall send the UEAssistanceInformation message to request UL SPS grant for V2X communication over NR-Uu from gNB. When <interface>=1, the UE shall send the UEAssistanceInformation message to request SL SPS grant for V2X communication over NR PC5 from gNB.

Refer subclause 9.2 for possible <err> values.

Test command returns the values supported as a compound value.

**Defined values**

<interface>: integer type. Indicates the interface type for which UE requests SPS grant from eNB.

0 request UL SPS grant for V2X communication over LTE-Uu from eNB

1 request SL SPS grant for V2X communication over E-UTRA PC5 from eNB

2 request UL SPS grant for V2X communication over NR-Uu from gNB

3 request SL SPS grant for V2X communication over NR PC5 from gNB

**Implementation**

Optional.

**<End of modified section 2>**