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Universal Mobile Telecommunications System (UMTS);
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AT command set for User Equipment (UE)
(3GPP TS 27.007 version 15.9.0 Release 15)**



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Foreword

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The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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1 Scope

The present document specifies a profile of AT commands and recommends that this profile be used for controlling Mobile Termination (MT) functions and network services from a Terminal Equipment (TE) through Terminal Adaptor (TA). The command prefix +C is reserved for Digital Cellular in ITU-T Recommendation V.250 [14]. The present document has also the syntax details used to construct extended commands. Commands from ITU-T Recommendation V.250 [14] and existing digital cellular standards (TIA IS-99 [15] and TIA IS-135 [16]) are used whenever applicable. Some of the new commands are defined such way that they can be easily applied to MT of other networks.

NOTE: The terms GSM and GSM/UMTS are used whenever appropriate for SIM/UICC GSM applications or GSM/UMTS bearer services or to represent specific mobile accesses covered by the present specification.

ITU-T Recommendation T.31 [11] and ITU-T Recommendation T.32 [12] fax AT commands may be used for GSM/UMTS fax transmission from TE. Short Message Service AT commands are defined in 3GPP TS 27.005 [24]. AT commands for packet systems are defined in clause 10 of this specification. The present document assumes an abstract architecture comprising a TE (e.g. a computer) and a MT interfaced by a TA (see figure 1). The span of control of the defined commands should allow handling of any physical implementation that this abstract architecture may lead to:

- TA, MT and TE as three separate entities;
- TA integrated under the MT cover, and the TE implemented as a separate entity;
- TA integrated under the TE cover, and the MT implemented as a separate entity; and
- TA and MT integrated under the TE cover as a single entity.

The commands described in the present document may be observed on the link between the TE and the TA. However, most of the commands retrieve information about the MT, not about the TA.

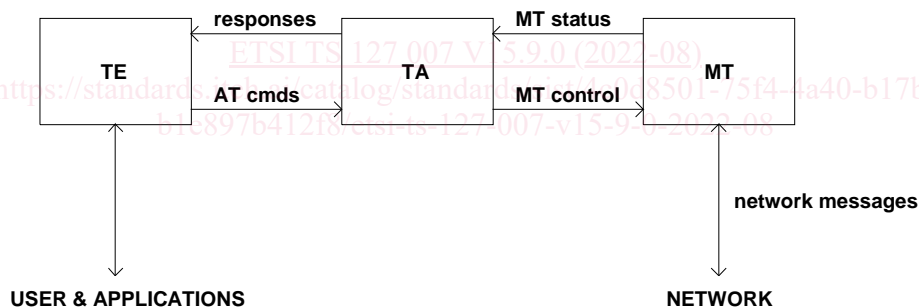


Figure 1: Setup

Interface between TE and TA is intended to operate over existing serial (ITU-T Recommendation V.24) cables, infrared link, and all link types with similar behaviour. For correct operation many of the defined commands require eight bit data and therefore it is recommended that TE-TA link is set to eight bits/ byte mode. (For infrared operation implementation, refer informative references IrDA. For embedding AT commands and data during on-line data state, refer TIA-617/ITU-T V.80.) Interface between TA and MT is dependent on the interface in the MT.

The functional blocks shown in figure 1, using AT commands, shall follow the principles described in the interactions handling framework 3GPP TS 23.227 [63].

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".