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Digitalni celiļ ni telekomunikacijski sistem (faza 2+) ï Nabor ukazov AT za mobilno opremo (ME) sistema GSM (GSM 07.07, razliļ ica 5.5.1)

Digital cellular telecommunications system (Phase 2+) (GSM); AT command set for GSM Mobile Equipment (ME) (GSM 07.07 version 5.5.1)

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Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07 version 5.5.1)

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the AT command for terminal equipments being used within the digital cellular telecommunications system.

The contents of this ETS is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of this ETS, it will be resubmitted for OAP by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:

- y the third digit is incremented when editorial only changes have been incorporated in the specification;

- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

Transposition dates	
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Introduction

The present document includes references to features which were introduced into the GSM Technical specifications after Release 96 of GSM Phase 2+. The text that is relevant, if the feature is supported, is marked with designators. GSM 10.01 defines the correspondence between these features and GSM yearly releases.

The following table lists all features that were introduced after Release 96 and have impacted this specification:

Feature	Designator
Technical enhancement and improvement: New AT-commands	$(AT R97)$
Support of Multiplexer according to GSM 07.10	$(MUX MS-TE)$

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1 Scope

This European Telecommunication Standard (ETS) specifies a profile of AT commands and recommends that this profile be used for controlling Mobile Equipment (ME) functions and GSM 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.25ter [14]. This ETS has also the syntax details used to construct these extended GSM commands. Commands from ITU-T Recommendation V.25ter [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 ME of networks other than GSM. ITU-T T.31 [11] and T.32 [12] fax AT commands may be used for GSM fax transmission from TE. GSM Short Message Service AT commands are defined in GSM 07.05 [24]. GPRS AT commands are defined in GSM 07.60 [34].This ETS assumes an abstract architecture comprising a TE (e.g. a computer) and a ME interfaced by a TA (see figure 1). The span of control of the defined commands should allow to handle any physical implementation that this abstract architecture may lead to:

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

The commands described in this ETS may be observed on the link between the TE and the TA. However, most of the commands retrieve information about the ME, not about the TA.

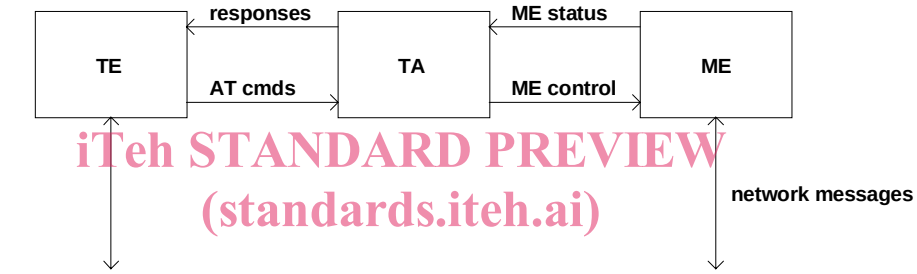

Figure 1: Setup

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 ME is dependent on the interface in the ME.

2 References

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

[1] GSM 02.02 (ETS 300 904): "Digital cellular telecommunication system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[2] GSM 02.03 (ETS 300 905): "Digital cellular telecommunication system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[3] GSM 02.81: "Digital cellular telecommunication system; Line identification supplementary services - Stage 1".

[4] GSM 02.82: "Digital cellular telecommunication system; Call Forwarding (CF) supplementary services - Stage 1".

[5] GSM 02.83: "Digital cellular telecommunication system; Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[6] GSM 02.88: "Digital cellular telecommunication system; Call Barring (CB) supplementary services - Stage 1".

[7] GSM 03.03 (ETS 300 927): "Digital cellular telecommunication system (Phase 2+); Numbering, addressing and identification".

[8] GSM 04.08 (ETS 300 940): "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 specification".

[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 Draft new Recommendation V.25ter: "Serial asynchronous automatic dialling and control".

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

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

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

[18] GSM 04.22 (ETS 300 946): "Digital cellular telecommunication system (Phase 2+); 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] GSM 02.30 (ETS 300 907): "Digital cellular telecommunication system (Phase 2+); Man Machine Interface (MMI) of the Mobile Station (MS)".

[20] GSM 05.08 (ETS 300 578): "Digital cellular telecommunication system (Phase 2); Radiosubsystem link control".

[21] GSM 02.85: "Digital cellular telecommunication system; Closed User Group (CUG) supplementary services - Stage 1".

[22] GSM 02.84: "Digital cellular telecommunication system; MultiParty (MPTY) supplementary services - Stage 1".

[23] GSM 02.90: "Digital cellular telecommunication system; Stage 1 description of Unstructured Supplementary Service Data (USSD)".

[24] GSM 07.05: "Digital cellular telecommunication system (Phase 2+); Use of Data Terminal Equipment - Data Circuit terminating Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS)".

[25] GSM 03.38 (ETS 300 900): "Digital cellular telecommunication system (Phase 2+); Alphabet and language specific information".

[26] GSM 02.24 (ETS 300 923): "Digital cellular telecommunication system; Description of Charge Advice Information (CAI)".

[27] GSM 02.86: "Digital cellular telecommunication system; Advice of Charge (AoC) supplementary services - Stage 1".

[28] GSM 11.11 (ETS 300 977): "Digital cellular telecommunication system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface".

[29] GSM 02.34: "Digital cellular telecommunication system (Phase 2+); High Speed Circuit Switched Data (HSCSD) - Stage 1".

[30] GSM 02.91: "Digital cellular telecommunication system (Phase 2+); Explicit Call Transfer (ECT) supplementary service - Stage 1".

[31] GSM 02.72: "Digital cellular telecommunication system (Phase 2+); Call Deflection (CD) supplementary service - Stage 1".

[32] ISO/IEC10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.

[33] GSM 02.22: "Digital cellular telecommunication system (Phase 2+); Personalisation of GSM Mobile Equipment (ME) Mobile functionality specification".

[34] GSM 07.60: "Digital cellular telecommunication system (Phase 2+); General requirements on Mobile Stations (MS) supporting General Packet Radio Bearer Service (GPRS)".

[35] CCITT Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

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

[37] ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

3 Abbreviations and definitions

3.1 Abbreviations

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

AT	ATtention; this two-character abbreviation is always used to start a command line to be sent from TE to TA
BCD	Binary Coded Decimal
ETSI	European Telecommunications Standards Institute
HSCSD	High Speed Circuit Switched Data
IMEI	International Mobile station Equipment Identity
IRA	International Reference Alphabet (ITU-T T.50 [13])
IrDA	Infrared Data Association
ISO	International Standards Organisation

ITU-T	International Telecommunication Union - Telecommunications Standardization Sector
ME	Mobile Equipment, e.g. a GSM phone (equal to MS; Mobile Station)
MoU	Memorandum of Understanding (GSM operator joint)
PCCA	Portable Computer and Communications Association
RDI	Restricted Digital Information
RLP	Radio Link Protocol
SIM	Subscriber Identity Module
TA	Terminal Adaptor, e.g. a GSM data card (equal to DCE; Data Circuit terminating Equipment)
TE	Terminal Equipment, e.g. a computer (equal to DTE; Data Terminal Equipment)
TIA	Telecommunications Industry Association
UDI	Unrestricted Digital Information

3.2 Definitions

For the purposes of this ETS, the following syntactical definitions apply (refer also clause 4):

<CR> Carriage return character, which value is specified with command S3.

<LF> Linefeed character, which value is specified with command S4.

<...> Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line.

[...] Optional subparameter of a command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. When subparameter is not given in *parameter type* commands, new value equals to its previous value. In *action type* commands, action should be done on the basis of the recommended default setting of the subparameter.

underline Underlined defined subparameter value is the recommended default setting of this subparameter. In *parameter type* commands, this value should be used in factory settings which are configured by V.25ter [14] command &F0. In *action type* commands, this value should be used when subparameter is not given.

4 AT command syntax

This clause summarizes general aspects on AT commands and issues related to them. For further information refer ITU-T Recommendation V.25ter [14].

4.1 Command line

See figure 2 for general structure of a command line. Standardized *basic* commands are found only in V.25ter [14]. GSM commands use syntax rules of *extended* commands. Every extended command has a *test command* (trailing =?) to test the existence of the command and to give information about the type of its subparameters. *Parameter type* commands also have a *read command* (trailing ?) to check the current values of subparameters. *Action type* commands do not store the values of any of their possible subparameters, and therefore do not have a read command.

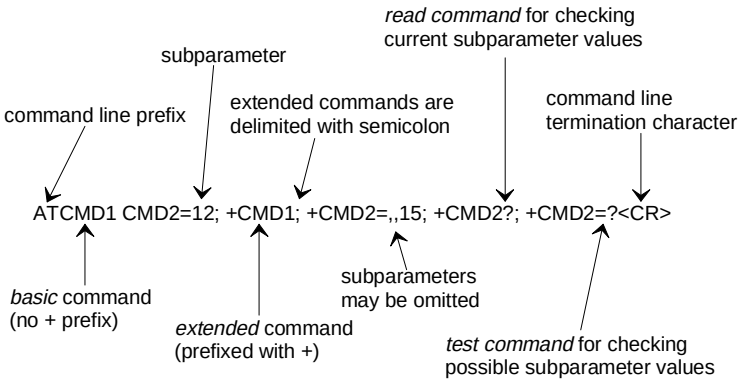

Figure 2: Basic structure of a command line

If verbose responses are enabled with command V1 and all commands in a command line has been performed successfully, result code <CR><LF>OK<CR><LF> is sent from the TA to the TE. If numeric responses are enabled with command V0, result code 0<CR> is sent instead.

If verbose responses are enabled with command V1 and subparameter values of a command are not accepted by the TA (or command itself is invalid, or command cannot be performed for some reason), result code <CR><LF>ERROR<CR><LF> is sent to the TE and no subsequent commands in the command line are processed. If numeric responses are enabled with command V0, result code 4<CR> is sent instead. ERROR (or 4) response may be replaced by +CME ERROR: <err> (refer clause 9) when command was not processed due to an error related to ME operation.

4.2 Information responses and result codes

The TA response for the example command line of figure 2 could be as shown in figure 3. Here, verbose response format is enabled with command V1. If numeric format V0 would have been used, <CR><LF> headers of *information response*s would have been left out and *final result code* changed to 0<CR>.

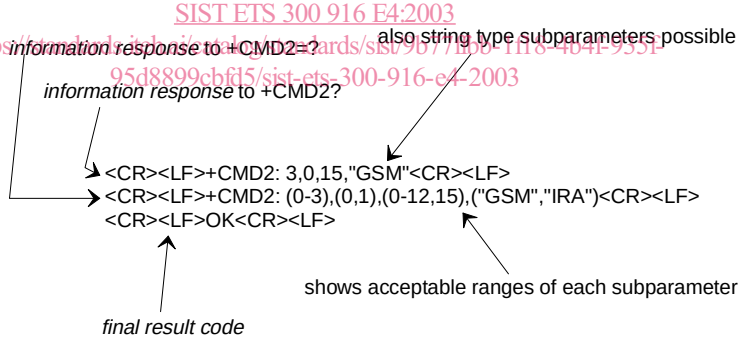

Figure 3: Response to a command line

So called *intermediate result code*s inform about progress of TA operation (e.g. connection establishment CONNECT), and so called *unsolicited result code*s indicate occurrence of an event not directly associated with issuance of a command from TE (e.g. ring indication RING).

4.3 ITU-T V.25ter [14] TE-TA interface commands

Table 1 summarizes V.25ter [14] commands relating to command line and response formatting, and TA-TE interface operation. All are applicable to GSM terminals.