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**European digital cellular telecommunications system (Phase 2);
Use of the V series Data Terminal Equipment - Data Circuit
terminating Equipment (DTE - DCE) interface at the
Mobile Station (MS) for Mobile Termination (MT) configuration
(GSM 07.06)**

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Foreword

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

This ETS describes an optional protocol for use at the 'R' reference point (the DTE/DCE interface) within the European digital cellular telecommunications system (Phase 2).

This ETS correspond to GSM technical specification, GSM 07.06 version 4.2.0.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM Technical Specifications (GSM-TS) (NOTE).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETTs (Phase 1), or ETTs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETs.

Proposed transposition dates	
Date of adoption of this ETS:	30 July 1995
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1 SCOPE

This technical specification describes an optional protocol for use at the 'R' reference point (the DTE/DCE interface) allowing a terminal equipment (TE2) to configure the mobile terminal (MT) using the 'V' series interface only.

The protocol across the DTE/DCE interface may use character mode or block mode commands (sent from the TE) and responses/indications (sent from the MT).

If this technical specification is implemented then the character mode protocol must be implemented whereas the block mode protocol is optional within this specification.

2 Normative references

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

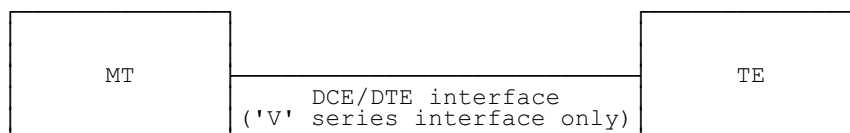
- [1] GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); Definitions, abbreviations and acronyms".
- [2] GSM 03.40 (ETS 300 536): "European digital cellular telecommunication system (Phase 2); Technical realization of the Short Message Service (SMS) Point to Point (PP)".
- [3] GSM 04.08 (ETS 300 557): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 specification".
- [4] GSM 04.22 (ETS 300 563): "European 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".
- [5] GSM 07.01 (ETS 300 582): "European digital cellular telecommunication system (Phase 2); General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".
- [6] GSM 07.05 (ETS 300 585): "European 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)".
- [7] GSM 11.11 (ETS 300 608): "European digital cellular telecommunication system (Phase 2); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".
- [8] CCITT Recommendation V.25 bis: "Automatic Calling and/or Answering Equipment on the General Switched Telephone Network (GSTN) using the 100-series interchange circuits".
- [9] CCITT Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No.5 or IA5) Information technology - 7-bit coded character set for information".
- [10] ETS 300 102: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications".

3 ABBREVIATIONS

In addition to those below, abbreviations used in this specification are listed in GSM 01.04.

<>	For descriptive purposes only
"	For descriptive purposes only
.....	Continuation (and so on)
V	Defined in GSM TS 07.05
M	Defined in GSM TS 07.05
C/R	CCITT IA5 Carriage Return Character
L/F	CCITT IA5 Line Feed Character
SPACE	CCITT IA5 Space Character
TE2	Terminal Equipment Type 2
IA5	CCITT International alphabet number 5; a set of characters and their coding specified in the CCITT Rec T.50.

4 REFERENCE CONFIGURATION



5 GENERAL DESCRIPTION

As described in GSM TS 07.01, the DTE/DCE interface is normally associated with the terminal adaptation function (TAF), if such a function is available. When no data connection is in progress and the TE wishes to enter a 'configuration' mode as defined in this specification, the command:-

CONFIG<SPACE><MODE><SPACE><PROTOCOL TYPE><C/R>

shall be sent by the TE to the MT where:-

CONFIG is a string of CCITT IA5 characters.

<MODE> is an indeterminate number of CCITT IA5 characters which defines the appropriate configuration mode according to Table 5/GSM 07.06.

<MODE>	Description
BCIE	Permits configuration of BCIE octets
RLP	Permits configuration of RLP parameters
SMS	Permits configuration of SMS parameters
SIM	Permits configuration of SIM parameters
LLC	Permits configuration of LLC parameters
HLC	Permits configuration of HLC parameters
IEMO	Indicates presence of Information Elements in MO Call Setup

Table 5/GSM 07.06

<PROTOCOL TYPE> is a single CCITT IA5 character which defines whether the DTE/DCE protocol is 'character mode' or 'block mode' when in the selected configuration mode. (see section 6 below):

<PROTOCOL TYPE>	Description
C	Character mode
B	Block mode

Upon receipt of the configuration command, the MT shall respond as follows:-

If the MT supports a particular configuration mode it shall respond with `VAL' as defined in V25 bis followed by a prompt `:' (colon). If the MT does not support a particular configuration mode it shall respond with `INV' as defined in V25 bis and remain in the V25 bis mode of operation. The VAL and INV responses shall contain delimiters as specified for V25bis.

If the configuration command is accepted by the MT then all further commands and responses/indications shall be as defined in section 4 of this technical recommendation. Once in the configuration mode, the TE may request the MT to return to the V25 bis mode at any time by sending the command `END CONFIG MODE'.

After returning to the V25bis mode, the MT shall respond with `VAL'.

A 'Break' condition at the V24 interface shall have the same effect as the 'END CONFIG MODE' command.

The state of the V24 circuits during a configuration mode shall be as described in GSM TS 07.05.

6 PROTOCOL DESCRIPTION

There are two types of protocol (Character mode and Block mode) which may be defined in <PROTOCOL TYPE>.

Both protocols allow the TE to read (List) or modify (Set) one or more of the parameters relevant to the particular configuration mode selected.

6.1 Character mode protocol

This protocol type is selected by setting the CCITT IA5 character 'C' in <PROTOCOL TYPE>.

The character mode protocol transfers a set of commands and responses across the 'R' reference point using the asynchronous character mode protocol described below.

All commands and responses are in CCITT IA5 character format 7 bits even parity.

6.1.1 Commands

6.1.1.1 LIST Command

The command `LIST' shall cause the MT to send the current values of one or more parameters from the particular configuration mode.

List all parameters.

LIST<C/R>

List specified parameters.

LIST<SPACE><REGISTER><SPACE>.....<REGISTER><C/R>

where <REGISTER> identifies a particular parameter within the configuration mode.

The CCITT IA5 character SPACE is used as a delimiter except after the last register in the command string.

6.1.1.2 SET Command

The command `SET' shall allow the TE to set or amend the values of one or more registers representing the parameters for a particular configuration mode.

The format of the SET command is as follows:-

SET<SPACE><REGISTER>,<VALUE><SPACE><REGISTER>,<VALUE>...<C/R>

where <REGISTER> identifies a particular parameter within the configuration mode and where <VALUE> identifies the desired setting of that particular register.

The CCITT IA5 character COMMA is used to separate registers and their values.

The CCITT IA5 character SPACE is used as a delimiter to separate one register and its value from another except after the last register value in the command string where a space is not necessary.

6.1.1.3 EXIT CONFIG MODE Command

The TE may request the MT to exit the selected Config Mode by sending the CCITT IA5 character string EXIT to the MT.

6.1.2 Responses

6.1.2.1 LIST response

The response to the 'LIST' command shall contain a list of the registers specified in the 'LIST' command together with their values.

The format of the 'LIST' response shall be as follows:

<REGISTER>,<VALUE><SPACE><REGISTER>,<VALUE>...<L/F><C/R>

where <REGISTER> identifies a particular parameter within the configuration mode and <VALUE> identifies the current setting of the value in a particular register.

The CCITT IA5 character COMMA is used to separate registers and their values.

The CCITT IA5 character SPACE is used as a delimiter to separate one register value from another except after the last register value in the command string where a space is not necessary.

The List response shall be followed by the prompt ':' (colon) sent from the MT.

6.1.2.2 SET response

The response to the 'SET' command shall be 'VAL' if the command syntax or range of values is correct followed by the prompt ':' (colon).

6.1.2.3 EXIT CONFIG MODE response

The valid response to an EXIT CONFIG MODE command shall be a V25bis VAL indication.

The invalid response shall be as described in 6.1.2.4 below.

6.1.2.4 Invalid command response

The response to a command whose syntax is incorrect or a command which cannot be actioned or where the command is not understood shall be a V25bis INV indication followed by the prompt ':' (colon).

If multiple commands are sent together and one or more is invalid then none is actioned and a V.25bis 'INV' indication is sent.

An invalid combination of parameter values may result in an 'INV' response (implementation option). e.g setting the BCIE for 9.6 kbit/s for a half rate channel.

A C/R sent by the TE at a prompt shall cause an INV response from the MT followed by another prompt.

6.2 Block mode protocol

This protocol type is selected by setting the CCITT IA5 character 'B' in <PROTOCOL TYPE>.

The block mode protocol transfers a set of commands and responses across the 'R' reference point using the character orientated protocol described below but formatted in accordance with GSM TS 07.05.

Where textual information is to be transmitted within the block mode protocol, 8 bit characters shall be sent with the eighth bit set to zero and the remaining 7 bits in CCITT IA5 representation.

Each command and response is assigned a value to align with the 'message type' defined in GSM TS 07.05.

8	7	6	5	4	3	2	1	
0	0	0	-	-	-	-	-	Commands issued by TE
0	0	0	0	0	0	0	0	LIST
0	0	0	0	0	0	0	1	SET
0	0	0	1	1	1	1	1	END CONFIG MODE
0	0	1	-	-	-	-	-	Responses/Indications issued by MT
0	0	1	0	0	0	0	0	LIST CONFIRM
0	0	1	0	0	0	0	1	LIST ERROR
0	0	1	0	0	0	1	0	SET CONFIRM
0	0	1	0	0	0	1	1	SET ERROR
0	0	1	1	1	1	1	1	END CONFIG MODE

Table 6.2 / GSM 07.06

6.2.1 Commands

6.2.1.1 LIST command

The command 'LIST' shall cause the MT to send the current values of one or more parameters from the particular configuration mode.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
<REGISTER>	6.2.1.1	M	LV	variable

Note: In certain configuration modes, a number of Registers may be specified by including more registers in the information element. If no register is to be included then the <REGISTER> element shall consist of a length octet only. This octet shall be set to zero.

List all parameters.

The use of a LIST command without a specified REGISTER or number of REGISTERS shall cause the MT to send to the TE a complete list of all registers and their current values.

List specified parameters.

The use of a LIST message type with a REGISTER or number of REGISTERS shall cause the MT to send to the TE a list of specified registers and their values.

The format for a number of REGISTERS is as follows:-

<REGISTER><SPACE><REGISTER><SPACE>....<REGISTER>

where <REGISTER> identifies a particular parameter within the configuration mode.

The CCITT IA5 character SPACE is used as a delimiter to separate one register from another.

6.2.1.2 SET command

The command 'SET' shall allow the TE to set or amend the values of one or more registers representing the parameters for a particular configuration mode.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
<SET COMMAND>	6.2.1.2	M	LV	variable

The <SET COMMAND> consists of a string of CCITT IA5 characters with the eighth bit set to zero. These characters represent the following

<REGISTER>,<VALUE><SPACE><REGISTER>,<VALUE>...<SPACE><REGISTER>,<VALUE>

where <REGISTER> identifies a particular parameter within the configuration mode and <VALUE> identifies the desired setting of the value for a particular register.

6.2.1.3 EXIT CONFIG MODE command

The command EXIT CONFIG MODE shall cause the MT to return to the V25bis mode of operation.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet

6.2.2 Responses

6.2.2.1 LIST CONFIRM response

The response to the 'LIST' command shall contain a list of the registers specified in the 'LIST' command together with their values.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
<LIST CONFIRM>	6.2.1.2	M	LV	variable

The <LIST CONFIRM> consists of a string of CCITT IA5 characters with the eighth bit set to zero. These characters represent the following

<REGISTER>,<VALUE><SPACE><REGISTER>,<VALUE>...<SPACE><REGISTER>,<VALUE>

where <REGISTER> identifies a particular parameter within the configuration mode and <VALUE> identifies the current setting of the value for a particular register.

6.2.2.2 LIST FAILURE response

The response to a LIST command shall be a 'LIST FAILURE' if the command syntax is incorrect or the command cannot be actioned by the MT.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
Cause	6.2.3	M	V	1 octet

6.2.2.3 SET CONFIRM response

The response to the 'SET' command shall be a 'SET CONFIRM' response if the command syntax is correct and the command is understood by the MT.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet

6.2.2.4 SET ERROR response

The response to a SET command shall be a 'SET ERROR' response if the command syntax is incorrect or the command cannot be actioned by the MT. This response is sent when multiple commands have been sent where at least one cannot be actioned. In this case, even the valid commands are not actioned.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
Cause	6.2.3	M	V	1 octet

6.2.2.5 EXIT CONFIG MODE response

The valid response to an EXIT CONFIG MODE command shall be the V25bis 'VAL' indication.

The invalid response shall be as described below.

Information element	Reference	Presence	Format	Length
Message Type	6.2	M	V	1 octet
Cause	6.2.3	M	V	1 octet

6.2.3 Error Causes

Commands which are deemed invalid by the MT are responded to with an error cause value given in Table 6.2.3 / GSM 07.06 below:

Cause value

8	7	6	5	4	3	2	1	
0	0	0	0	0	0	0	0	Command syntax error
0	0	0	0	0	0	0	1	Command not supported in the MT
0	0	0	0	0	0	1	0	Register invalid
0	0	0	0	0	0	1	1	Value out of range
0	0	0	0	0	1	0	0	Illegal parameter combination (see Note1)

All other code values are reserved

Table 6.2.3 / GSM 07.06

Note 1: An illegal combination of parameter values may result in an invalid response (implementation option). e.g setting the BCIE for 9.6 kbit/s for a half rate channel.

7 CONFIGURATION MODES

7.1 CONFIG BCIE

Each BCIE octet is has an associated <REGISTER> and <VALUE> identification which is in strict alignment with the octet number and its value defined in GSM TS 04.08. The content of the BCIE depends on the selected bearer service/teleservice and is defined in GSM TS 07.01.

It shall not be possible for the TE to change GSM TS 04.08 octet 0 or octet 1. Octet 1 must be maintained by the MT. Any attempt to change octets 0 or 1 will result in an invalid command response.

7.1.1 Configuration using the Character or the Block mode protocol

<REGISTER> shall be in IA5 character format.

<VALUE> shall be in IA5 character format each character representing the semi octet hexadecimal value

e.g. SET 3a,3F 4,C1 6a,10

The above example shows BCIE octet 3A being set to 3F hex, octet 4 being set to C1 hex and octet 6a being set to 10 hex.

The MT shall be case insensitive to upper and lower case.

7.2 CONFIG RLP

Each RLP parameter has an associated <REGISTER> and <VALUE> representing parameter names and their values as defined in GSM TS 04.22.

<REGISTER>	GSM TS 04.22 reference
01	k MS to IWF
02	k IWF to MS
03	Timer T1
04	Timer T2
05	Number of retransmissions N2

Table 7.2 / GSM 07.06

7.2.1 Configuration using the Character or the Block mode protocol

<REGISTER> and <VALUE> shall be in CCITT IA5 character format.

e.g. SET 03,800 01,50

The above example shows RLP parameter T1 being set to 800 decimal and RLP parameter k MS to IWF being set to 50 decimal.

The MT shall be case insensitive to upper and lower case.

7.3 CONFIG SMS

7.3.1 Service Centre Specific Features

Certain Service Centre specific features listed below may be set or listed.

<REGISTER>	GSM TS 03.40 reference
01	Protocol Identifier
02	TP_Status Message
03	TP_Command_Type
04	Enable INC SMS (GSM TS 07.05)
05	Enable INC CBS (GSM TS 07.05)

The SET command shall allow an alpha-numeric string (name) to be assigned to a particular register value.

<REGISTER> shall be in IA5 character format

<VALUE> shall be in IA5 character format, the first two characters and representing the semi octet hexadecimal value to be assigned to the register delimited by <SPACE> optionally followed by a string of IA5 characters representing the name to be associated with that particular register value.

In the case of registers 04 and 05, 01 Hex = enable 00 Hex = disable

e.g SET 01, C9 ACME NETWORK

The example shows a the Protocol Identifier octet set to C9 hex and named as the ACME Network.

7.4 CONFIG SIM

SIM parameters listed below may be set or listed in future versions of this Technical Specification.

GSM 11.11 reference

PLMN Selector
ADN/SSC
ADN/SSC Extension
Capability/configuration parameters
SMS Parameters
FDN/SSC
FDN/SSC Extension
Language Preference
[Cell Broadcast Selection parameters]

7.5 CONFIG LLC

Each LLC octet has an associated <REGISTER> and <VALUE> which is in strict alignment with the octet number and value defined in ETS 300 102. The content of the LLC depends on the selected bearer service/teleservice and is defined in GSM TS 07.01.

7.5.1 Configuration using the Character or the Block mode protocol

<REGISTER> shall be in IA5 character format.

<VALUE> shall be in IA5 character format each character representing the semi octet hexadecimal value.

7.6 CONFIG HLC

Each HLC octet has an associated <REGISTER> and <VALUE> which is in strict alignment with the octet number and value defined in ETS 300 102. The content of the HLC depends on the selected bearer service/teleservice and is defined in GSM TS 07.01.

7.6.1 Configuration using the Character or the Block mode protocol

<REGISTER> shall be in IA5 character format.

<VALUE> shall be in IA5 character format each character representing the semi octet hexadecimal value.

7.7 Config IEMO

The IEMO octet has an associated <REGISTER> and a <VALUE>. <REGISTER> shall be in IA5 character format. <VALUE> shall be in IA5 format each character representing the semi octet hexadecimal value.

<REGISTER>	
01	Selected Information Elements in MO Call SETUP

7.7.1 <REGISTER> 01

The format of <REGISTER> 01 is as follows:

8	7	6	5	4	3	2	1
BC1	LLC1	HLC1	BC2	LLC2	HLC2	BC RI	

The <VALUE> assigned to <REGISTER> 01 is in accordance with the following:

bit 3 to 8: 0 respective Information Element not present in Call Setup
 1 respective Information Element present in Call Setup

bit 2 1: Repeat Indicator related to BCs

0	0	Not Applicable
0	1	Circular
1	0	Sequential
1	1	Reserved

Example: Configuration of Call SETUP for Bearer Service 81

CONFIG IEMO C

SET 01, BA

where the <VALUE> of <REGISTER> 01 is:

8	7	6	5	4	3	2	1
1	0	1	1	1	0	1	0

History

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