# Siemens S40 proprietary AT command reference

## Version 1.1

# 1 Introduction

The present document specifies the proprietary AT commands of the Siemens S40 mobile phone. These AT commands are used to read and write address book items, address book groups, calendar events, greeting pictures, ring tones, and WAP settings from/to the phone.

It is recommended that the following documents are consulted prior to applying the AT commands specified by this document:

- ETSI TS 100 916/GSM 07.07: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME), available from ETSI (http://www.etsi.org/)
- vCalendar - The Electronic Calendaring and Scheduling Exchange Format, Version 1.0, available from IMC (http://www.imc.org/)
- vCard - The Electronic Business Card, Version 2.1, available from IMC (http://www.imc.org/)

The Siemens S40 proprietary AT commands have not been published by Siemens. The content of this document is the result of both insider information and intense research. However, some aspects are still unknown or unclear.

If you have additional information useful for the purpose of this document please contact the author: frank@s40forum.de.

Technical questions and developer issues related to the Siemens S40 can be discussed online: http://www.s40forum.de/developer.html.

# 2 Disclaimer

The present document is provided "as is". Using the information found in this document is at your own risk. In no event can the author be held responsible for any damages that result from the use or inability to use the content of this document.

This document is neither approved nor supported by Siemens. The author is not affiliated with Siemens in any way.

# 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| AT | ATtention; this two-character abbreviation is always used to start a command line to be sent from an application to the Siemens S40 |
| DP | <Unknown> |
| ETSI | European Telecommunications Standards Institute |
| FFS | <Unknown> |
| GSM | Global System for Mobile Communication |
| IMC | Internet Mail Consortium |
| MS | Mobile station |
| TS | Technical Specification |
| UCS2 | Universal Character Set coded in 2 octets |
| UID | Unique identifier |
| UPPB | <Unknown> |

# 4 Definitions

For the purposes of this document, the following syntactical definitions apply:

| | |
|---|---|
| <CR> | Carriage return character (#13) |
| <LF> | Line feed character (#10) |
| <...> | 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 the Siemens S40 information response is enclosed in square brackets. Brackets themselves do not appear in the command line. |

# 5 Data transfer commands

## 5.1 +C#SMDE: Data transfer mode start and stop

The +C#SMDE command is used to start and stop the data transfer mode.

Syntax:

| Command | Possible response(s) |
|---|---|
| +C#SMDE=<mode> | + C#SMDE: <type>,<length><br>[Total records: <total>]<br>[Maximum records: <x>]<br>[IEL: <x>]<br>[HD: <x>]<br>[SAT: <x>]<br>[DID: <x>]<br>[ICL: <x>]<br>[OCL: <x>]<br>[MCL: <x>]<br>[<Begin><br>X-SIEMENS-GROUP-ID:2<br>X-SIEMENS-NPI;TYPE=HOME;WORK;CELL;FAX;MODEM:1<br><End>]<br>[<Begin><br>X-SIEMENS-GROUP-NAME:20<br>X-SIEMENS-GROUP-SOUND-ID:2<br>X-SIEMENS-GROUP-ID:2<br>X-SIEMENS-GROUP-NOF-ENTRIES:<x><br>X-SIEMENS-NPI;TYPE=HOME;WORK;CELL;FAX;MODEM:1<br><End>]<br>[<x>]<br>+CME ERROR: <err> |
| +C#SMDE=? | +C#SMDE: list of supported <mode>s |
| +C#SMDE? | +C#SMDE: <mode> |

Supported values:

<mode>

0      transfer stop/disabled

1      transfer start/enabled

<type>

0      Address book item

1      Address book group

2      Calendar event

8      Greeting image

9      Ring tone

11     WAP setting

Amount of bytes for the response

`<total>`

Number of stored entries (address book items, address book groups and calendar events only)

`<x>`

Data and/or value with unknown meaning

`<err>`

See section 6 for details.

## 5.2 +C#SLST: Request entry UID list

The +C#SLST command is used to get a list of entry UIDs of a given type.

Syntax:

| Command | Possible response(s) |
|---|---|
| `+C#SLST=<type>` | `+C#SLST: <more>,<length><CR><LF>`<br>list of `<UID>`s<br>`+CME ERROR: <err>` |
| `+C#SLST=?` | list of supported `<type>`s |

Supported values:

`<type>`

0   Address book item

1   Address book group

2   Calendar event

8   Greeting image

9   Ring tone

11  WAP setting

`<more>`

0   no more UIDs available

1   more UIDs available, repeat previous `+C#SLST` command

`<length>`

Size of list in bytes

`<UID>`

See section 7 for details.

`<err>`

See section 6 for details.

### 5.3 +C#SPUT: Writing an entry to the phone

The +C#SPUT command is used to add a new entry or modify an existing entry of a given type.

UIDs for new entries are automatically allocated by the phone. Existing entries can be replaced by adding their UID to the command.

Syntax:

| Command | Possible response(s) |
|---|---|
| `+C#SPUT=<type>,<length>[,<UID>]<CR>`<br>***<entry> is given*** | `+C#SPUT: <UID>`<br>`+CME ERROR: <err>` |
| `+C#SPUT=?` | list of supported `<type>`s,<br>list of supported `<length>`s,<br>list of supported `<UID>`s |

Supported values:

`<type>`

| | |
|---|---|
| `0` | Address book item |
| `1` | Address book group |
| `2` | Calendar event |
| `8` | Greeting image |
| `9` | Ring tone |
| `11` | WAP setting |

`<length>`

`1-4294967294`     Size of entry in bytes

`<UID>`

`0-4294967294`     Range of possible UIDs, see section 7 for details

`<entry>`

See section 8 for details.

`<err>`

See section 6 for details.

### 5.4 +C#SGET: Reading an entry from the phone

The +C#SGET command is used to read an existing entry of a given type.

Syntax:

| Command | Possible response(s) |
|---|---|
| +C#SGET=<type>,<UID> | +C#SGET: <length><CR><LF> <entry> +CME ERROR: <err> |
| +C#SGET=? | list of supported <type>s, list of supported <UID>s |

Supported values:

<type>

0    Address book item

1    Address book group

2    Calendar event

8    Greeting image

9    Ring tone

11   WAP setting

<UID>

0-4294967294        Range of possible UIDs, see section 7 for details

1-4294967294        Size of entry in bytes

<entry>

See section 8 for details.

<err>

See section 6 for details.

### 5.5 +C#SDEL: Deleting an entry

The +C#SDEL command is used to delete an existing entry of a given type.

| Command | Possible response(s) |
|---|---|
| +C#SDEL=<type>,<UID> | +CME ERROR: <err> |
| +C#SDEL=? | list of supported <type>s, list of supported <UID>s |

Supported values:

<type>

0    Address book item

1    Address book group

2       Calendar event

8       Greeting image

9       Ring tone

11      WAP setting

`<UID>`

0-4294967294       Range of possible UIDs, see section 7 for details

`<err>`

See section 6 for details.

# 6 Error result code +CME ERROR

Siemens S40 specific `<err>` values (numeric format followed by verbose format):

+CME ERROR 256: Not enough memory

+CME ERROR 257: Error deleting entry

+CME ERROR 258: Entry does not exist

+CME ERROR 259: Error transmitting entry

+CME ERROR 260: Access denied

+CME ERROR 261: MS busy

+CME ERROR 262: Wrong amount of data transferred

+CME ERROR 263: Entry type does not exist

+CME ERROR 264: Data transfer stopped

+CME ERROR 265: UPPB not ready

+CME ERROR 266: Parse too complex

+CME ERROR 267: Parse syntax error

+CME ERROR 268: Parse RRULE

+CME ERROR 269: Parse VEND

+CME ERROR 270: Parse VERSION

+CME ERROR 271: DP FFS create error

+CME ERROR 272: DP FFS write error

+CME ERROR 273: DP transfer timeout error

+CME ERROR 274: DP transfer stop error

+CME ERROR 275: DP FFS read error

+CME ERROR 276: DP FFS fptr error

+CME ERROR 277: DP FFS mail error

# 7 Unique Identifiers

Each entry of any type is identified by a unique integer.

A list of UIDs of a given type can be obtained using the +C#SLST command. In case of address book items and address book groups the list is sorted alphabetically.

Every UID returned after the +C#SLST command consists of 6 bytes. A list of *n* UIDs always consists of *n* * 6 bytes. There are no separators between UIDs.

Of the 6 bytes only the first 4 bytes are relevant. The meaning of the last 2 bytes is unknown.

The UID bytes are stored as hexadecimal values and in reverse order. To calculate the integer value of a UID first reverse the byte order and then convert from hexadecimal to decimal value.


Example:

1. +C#SLST returns 6 UID bytes: 0B 00 02 19 1C 00
2. Only the first 4 bytes are relevant: 0B 00 02 19
3. Reverse byte order: 19 02 00 0B
4. Convert hexadecimal 1902000B to decimal: 419561472


On a newly updated or reset phone

- address book item UIDs start from 419561472
- address book group UIDs start from 419889152
- calendar event UIDs start from 637534208
- the greeting picture always has UID 1
- the 42 factory ring tone UIDs range from 400 to 441
- custom ring tone UIDs start from 442
- WAP setting UIDs start from 687865872.

New UIDs of any type are ascending if allocated by the phone (i.e. no UID is specified in the +C#SPUT command). Whenever an entry is deleted its UID will not be reallocated automatically by the phone until it is updated or reset.

# 8 Entry type coding schemes

## 8.1 Address book items

Address book items are stored in the vCard format. They are transferred from/to the phone as plain text.

The following vCard extension properties are used in address book items:

- `X-SIEMENS-GROUP-ID`

  This property is used to assign address book items to address book groups. A property value of -1 indicates that an item is not assigned to any group. To assign an item to a group set the group ID (not the group UID, see details in section 8.2) as property value.

- `X-SIEMENS-GROUP-SOUND-ID`

  The meaning of this property in the address book item context is unknown.

- `X-SIEMENS-GROUP-NOF-ENTRIES`

  The meaning of this property in the address book item context is unknown.

- `X-SIEMENS-NPI;HOME`

  The use of this property is unknown. The property value is set to 1 if a home phone number is specified in the address book item, otherwise it is set to 0.

- `X-SIEMENS-NPI;WORK`

  The use of this property is unknown. The property value is set to 1 if an office phone number is specified in the address book item, otherwise it is set to 0.

- `X-SIEMENS-NPI;CELL`

  The use of this property is unknown. The property value is set to 1 if a mobile phone number is specified in the address book item, otherwise it is set to 0.

- `X-SIEMENS-NPI;FAX`

  The use of this property is unknown. The property value is set to 1 if a fax number is specified in the address book item, otherwise it is set to 0.

- `X-SIEMENS-NPI;MODEM`

  The use of this property is unknown. The property value is set to 1 if a data number is specified in the address book item, otherwise it is set to 0.

## 8.2. Address book groups

Address book groups are stored in the vCard format. They are transferred to/from the phone as plain text.

The following vCard property extensions are used in address book groups:

- `X-SIEMENS-GROUP-NAME`

  The value of this property contains the address book group name. (Note: The built-in editor of the S40 displays up to 20 characters.)

- `X-SIEMENS-GROUP-ID`

  The value of this property contains the address book group ID. The group ID can be computed by the formula

  $$\text{group ID} = \text{group UID} - 419889152$$

  with 419889152 being the value of the first allocated group UID (see section 7 for details). Thus the first group stored after a reset or an update has group ID 0, the second has group ID 1, etc.

- `X-SIEMENS-GROUP-SOUND-ID`

  This property is used to assign ring tones to groups. A property value of -1 indicates the standard ring tone as specified in the S40 tones setup. To assign a different ring tone set its UID as property value.

- `X-SIEMENS-GROUP-NOF-ENTRIES`

  The value of this property contains the number of address book items that are assigned to the group.

- `X-SIEMENS-NPI;HOME`

  The meaning of this property in the address book group context is unknown.

- `X-SIEMENS-NPI;WORK`

  The meaning of this property in the address book group context is unknown.

- `X-SIEMENS-NPI;CELL`

  The meaning of this property in the address book group context is unknown.

- `X-SIEMENS-NPI;FAX`

  The meaning of this property in the address book group context is unknown.

- `X-SIEMENS-NPI;MODEM`

  The meaning of this property in the address book group context is unknown.

### 8.3 Calendar events

Calendar events are stored in the vCalendar format. They are transferred to/from the phone as plain text.
The Siemens S40 accepts only one vEvent in each vCalendar.

### 8.4 Greeting picture

The Siemens S40 shows a user-defined greeting logo during network search. (Note: Permanently shown operator logos are not supported.)
The greeting logo is an image with a size of 104 * 64 = 6656 pixels and 4 colours (2 bit colour depth) that are displayed as black, dark grey, light grey, and white.
The greeting logo data has a fixed size of 1670 bytes: The first 6 bytes compose the UID (always 1). They are followed by 1664 bytes of pixel data with every pixel data byte covering 4 pixels.

### 8.5 Ring tones

The Siemens S40 ring tones consist of a maximum of 255 tones. Each tone is defined by a frequency and a duration. The frequency range is from 440 Hz to 3520 Hz. Duration is specified in milliseconds. Trailing tones with the same frequency are played as one tone with duration added up. A pause is a tone with a frequency of 0 and a given duration.
The first 4 bytes (1 to 4) of the ring tone data compose the ring tone UID (see section 7 for details).
The next 42 bytes (5 to 46) contain the ring tone name in UCS2 format (i.e. 2 bytes per character). Ring tone names can have up to 20 characters and are null terminated (42 bytes = 20 characters * 2 bytes + #0 * 2 bytes). If ring tone names are shorter than 20 characters the remaining name bytes are undefined but must be present.
The following byte (47) must always be set to 1 in custom ring tones. (Note: It is set to 0 in factory ring tones.)
The next byte (48) specifies the number of tones.
The ring tone data ends with pairs of 2 frequency bytes (low byte and high byte) and 2 duration bytes (low byte and high byte) for each tone.

## 8.6 WAP settings

The coding scheme of WAP settings is unknown.