

EMS Guidelines for One Touch™ 511*/512 & One Touch™310/311

* : Mobile Services version

TABLE OF CONTENT

* : Mobile Services version

1. INTRODUCTION

The goal of this document is to provide some guidelines to service and content providers for the formatting of EMS content for the Alcatel One Touch™ 511*/One Touch™ 512 & One Touch™ 310/311.

This document is not a description of the EMS standard but it will give you some highlights on the way to design EMS features. To know more about EMS as a transport protocol refer to the following 3GPP technical specifications:

- 3GPP TS 23.040 V4.4.0 (Release 4)

The sound format supported with EMS is the iMelody format as described in :

- Infrared Data Association, Specifications for Ir Mobile Communications (IrMC). iMelody v1.0

All text between " " is quoted from these specifications except the bold characters.

The One Touch™ 511*/One Touch™ 512 and the One Touch™ 310/311 are Release 4 compliant with the restrictions mentioned in the rest of this document.

2. DESCRIPTION OF THE EMS FEATURES

The EMS standard allows the user to send or to receive by SMS a message composed of elements such as text formatting commands, pictures, animations and sounds.

2.1 Pictures

"It is possible to include either a small (16*16 pixels), large (32*32 pixels) or pictures of variable size. These pictures have neither animation nor grey scales, it is plain black and white. All pictures are user defined. The size of one picture is 128 bytes maximum."

To calculate the size of a picture, apply the following formula : (W/8) * h where W is the width in pixels and h the height in pixels. This size must be <= 128 and W must be a multiple of 8. This allows for example a the size of 32 x 32 pixels, 16x16 pixels…

One Touch™511*/One Touch™512 & One Touch™310/311 do not support the stitching mechanism defined in 3GPP TS 23.040 V4.4.0 (Release 4).

* : Mobile Services version

2.2 Animations

There are two different kinds of EMS animations : predefined and user-defined animations.

- Predefined animations

"There are a number of predefined animations. These animations are not sent as animation over the air interface, only the identification of them. As soon as the position of the animation in the SM data is reached, the animation corresponding to the received number shall be displayed in a manner which is manufacturer specific."

There are 6 predefined animations in Release 99 and 9 additional animations in Release 4.

Animation number	Description	Smiley small font	Smiley big font
0	I am ironic, flirty		
1	I am glad		
2	I am sceptic		
3	I am sad		
4	WOW!		
5	I am crying		
6	I am winking		
7	I am laughing		
8	I am different		
9	In love / Kissing		

* : Mobile Services version

10	I am confused		
11	Tongue hanging out		
12	I am angry		
13	Wearing glasses		
14	Devil		

- User defined animations

"The user-defined animations consist of **4 pictures** and there are two different sizes of these animations. The picture size of the small animations are **8*8 pixels** and the large **16*16 pixels**. These animations are sent over the air interface."

2.3 Sounds

Like animations, there are two kinds of sounds : predefined and user defined sounds. User-defined sounds in EMS are coded according to the iMelody format and are limited to 128 bytes.

- Predefined sounds

"There are **ten predefined sounds**. These sounds are not transferred over the air interface, only the identification of them. There are 10 different predefined sounds that can be added in the message."

Sound number	Sounds names
0	Chimeshigh
1	Chimeslow
2	Ding
3	Tada

* : Mobile Services version

4	Notify
5	Drum
6	Claps
7	Fanfar
8	Chordhigh
9	Chordlow

- User defined sounds or “iMelody”

“The sender can define his/her own melodies according to the iMelody format.”(cf “Infrared Data Association, Specifications for Ir Mobile Communications (IrMC) V1.0”). “These melodies are transferred in the SM and can take up to 128 bytes.”

Please refer to the document Content One Touch™ 511*/One Touch™ 512 & Content One Touch™ 310-311 to see the embedded content.

2.5 Text formatting

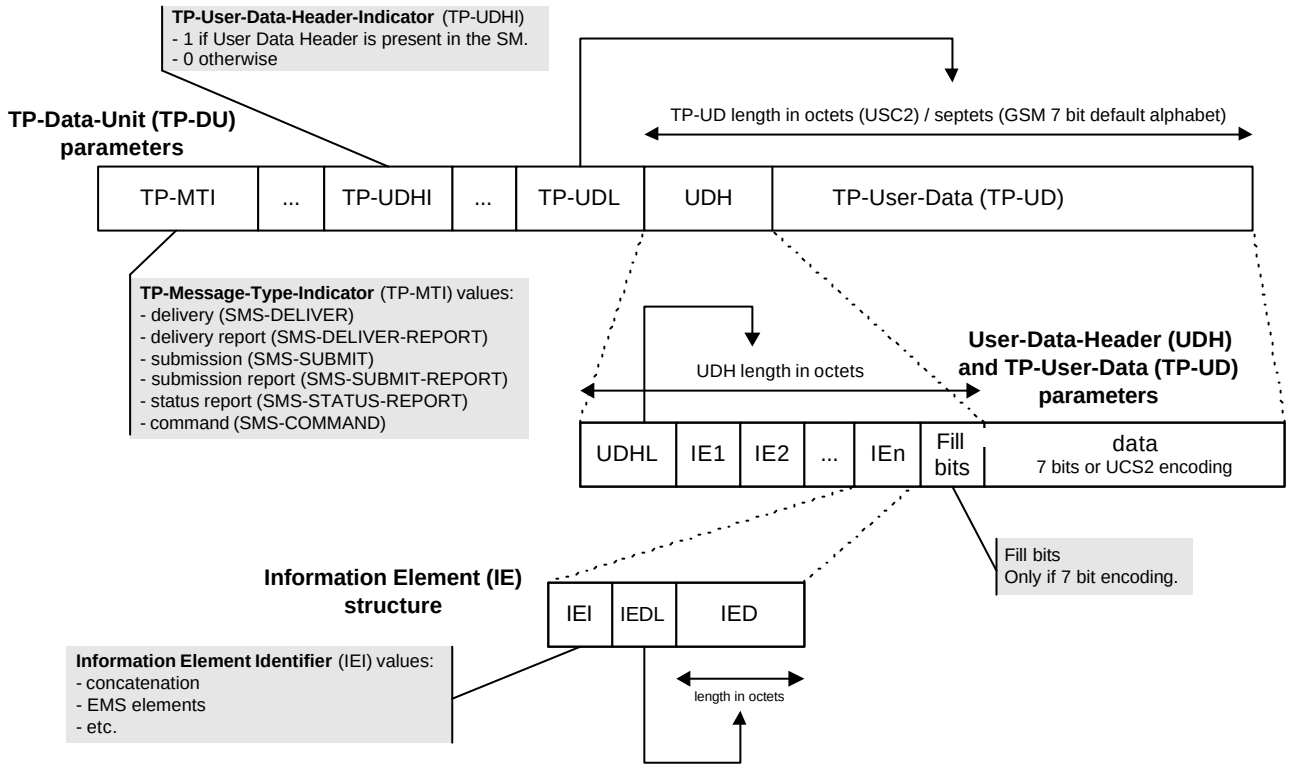
Text formatting commands allows the message text to be formatted (text alignment, font sizes, etc.). This feature is not supported on One Touch™511*/One Touch™512 & One Touch™ 310/311.

2.6 User Prompt Indicator

This feature introduced in 3GPP TS 23.040 Release 4 allows handsets to stitch pictures and melodies. It also allows the user to be prompted upon reception of the message so to execute media specific actions (storage, handset personalisation, etc). This feature is not supported by the One Touch™511*/One Touch™512 & One Touch™ 310/311.

3. EMS Encoding

At the application level, a short message is manipulated in the form of a Transport Protocol Data Unit (TPDU). The TPDU is a sequence of parameters containing information such as the class of the message, the length, embedded EMS elements and associated text. The structure of a TPDU is shown below :



3.1 General TPDU Parameters

The TPDU parameters shall be set as follows :

- **TP-UDHI** = 1 (indicates that a User Data Header is present within the TP-User-Data : mandatory)
- **TP-PID** = 00
- **TP-DCS** = “UCS2 (16 bits)” or “GSM 7 bit default alphabet”

« The definition of the TP User-Data-Length (TP-UDL) field which immediately precedes the " User Data Header Length (UDHL)" is unchanged and shall therefore be the total length of the TP-User-Data field including the Header, if present. »

* : Mobile Services version

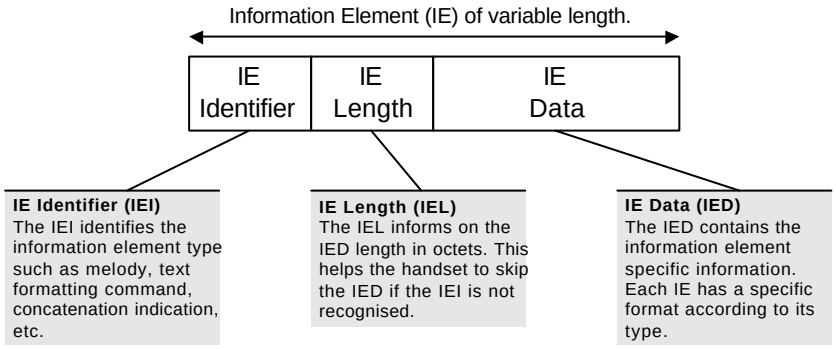
3.2 TP-User-Data

3.2.1 User Data Header

The User Data Header is composed of :
- the User Data Header Length (UDHL)
- followed by one or several Information Elements.

"The UDHL field shall be the integer representation of the number of octets within the "User-Data-Header" information fields which follow and shall not include itself in its count or any fill bits which may be present ."

Information elements may appear in any order.



The Information Element Identifier octet shall be coded as follows:

VALUE (hex)	MEANING
00	Concatenated short messages, 8-bit reference number
08	Concatenated short message, 16-bit reference number
	Reserved for SMS use.
0A	Text Formatting
0B	Predefined Sound
0C	User Defined Sound (iMelody max 128 bytes)
0D	Predefined Animation
0E	Large Animation (16*16 times 4 = 32*4 =128 bytes)
0F	Small Animation (8*8 times 4 = 8*4 =32 bytes)
10	Large Picture (32*32 = 128 bytes)
11	Small Picture (16*16 = 32 bytes)
12	Variable Picture
13	User Prompt indicator
14-1F	Reserved for future EMS features

➢ Concatenated messages

This mechanism allows long messages to be concatenated in several short messages.

For 8 bit reference number, the following IEI and associated IEDL and IED shall be present in every segment of the concatenated SM:

- IEI = 00 (hex)
- IEDL = 4
- IED = coded as follows

"Octet 1 Concatenated short message reference number

This octet shall contain a modulo 256 counter indicating the reference number for a particular concatenated short message. This reference number shall remain constant for every short message which makes up a particular concatenated short message.

Octet 2 Maximum number of short messages in the concatenated short message.

This octet shall contain a value in the range 0 to 255 indicating the total number of short messages within the concatenated short message. The value shall start at 1 and remain constant for every short message which makes up the concatenated short message. If the value is zero then the receiving entity shall ignore the whole Information Element.

Octet 3 Sequence number of the current short message.

This octet shall contain a value in the range 0 to 255 indicating the sequence number of a particular short message within the concatenated short message. The value shall start at 1 and increment by one for every short message sent within the concatenated short message. If the value is zero or the value is greater than the value in octet 2 then the receiving entity shall ignore the whole Information Element.

The IEI and associated IEI length and IEI data shall be present in every segment of the concatenated SM."

For 16 bit reference number, the following IEI and associated IEDL and IED shall be present in every segment of the concatenated SM:

- IEI = 08 (hex)
- IEDL = 3
- IED = coded as follows

"Octet 1-2 Concatenated short messages, 16-bit reference number

This octet shall contain a modulo 65536 counter indicating the reference number for a particular enhanced concatenated short message. This reference number shall remain constant for every short message which makes up a particular enhanced concatenated short message.

* : Mobile Services version

Octet 3 Maximum number of short messages in the enhanced concatenated short message.

This octet shall contain a value in the range 0 to 255 indicating the total number of short messages within the concatenated short message. The value shall start at 1 and remain constant for every short message which makes up the enhanced concatenated short message. If the value is zero then the receiving entity shall ignore the whole Information Element.

Octet 4 Sequence number of the current short message.

This octet shall contain a value in the range 0 to 255 indicating the sequence number of a particular short message within the concatenated short message. The value shall start at 1 and increment by one for every short message sent within the concatenated short message. If the value is zero or the value is greater than the value in octet 3 then the receiving entity shall ignore the whole Information Element.

The IEI and associated IEI length and IEI data shall be present in every segment of the concatenated SM."

The One Touch™ 511*/One Touch™ 512 & One Touch™ 310/311 can receive or send concatenated messages composed of a maximum of 10 segments. Received segments which have a segment number greater than 10 are automatically deleted by the One Touch™ 511*/One Touch™ 512 & One Touch™ 310/311.

3.2.1.1 Pictures

There are two different types of pictures : fixed and the variable sizes.

- Fixed sizes : 16x16 and 32x32 pixels

"The Information-Element-Data octet(s) shall be coded as follows:

Octet 1 position indicating in the SM data the instant the picture shall be displayed. Set to the number of characters from the beginning of the SM data after which the picture shall be displayed. This octet shall be coded as an integer value in the range 0 (beginning of the SM data) to the maximum number of characters included in the SM data of one single SM or one segment of a concatenated SM.

Octet 2 Pictures are coded from upper left to lower right and in each byte the most significant bit represent the pixel at the left. The pictures are plain black and white, no colours or grey scales are supported. The bitvalue "0" represents a white pixel and the bitvalue "1" represents a black pixel."

* : Mobile Services version

Example 16*16 picture

Byte 1	Byte 2
Byte 3	Byte 4
…	…
…	…
Byte 31	Byte 32

➢ Variable picture

"The Information-Element-Data octet(s) shall be coded as follows:

Octet 1 position indicating in the SM data the instant the picture shall be displayed in the SM data

Octet 2 Horizontal dimension of the picture. This octet shall contain the horizontal number of 8 pixels i.e. this value shall be multiplied by 8 to get the whole number of horizontal pixels.

Octet 3 Vertical dimension of the picture. This octet shall contain the vertical number of pixels.

Octet 4-n This octet(s) shall contain a Variable Picture line by line from top left to bottom right, as described for the (16x16) & (32x32) pictures."

3.2.1.2 Animations

There are two kind of animations : the predefined and the user defined animations.

➢ Predefined animations

"The Information-Element-Data octet(s) shall be coded as follows.

Octet 1 position indicating in the SM data the instant the animation shall be displayed. Set to the number of characters from the beginning of the SM data after which the animation shall be displayed. This octet shall be coded as an integer value in the range 0 (beginning of the SM data) to the maximum number of characters included in the SM data of one single SM or one segment of a concatenated SM.

Octet 2 animation number. Shall be encoded as an integer value."

➢ User defined animations

"The Information-Element-Data octet(s) shall be coded as follows:

Octet 1 position indicating the instant the animation shall be displayed in the SM data.

Octet 2-n Animations are coded as 4 sequential pictures, with the first picture sent first."

3.2.1.3 Sounds

Like the animation feature, there are two kind of sounds : the predefined sounds and the user defined sounds also called " iMelody".

- Predefined sounds

"The Information-Element-Data octet(s) shall be coded as follows.

Octet 1 position indicating in the SM data the instant after which the sound shall be played. It will be set to the number of characters from the beginning of the SM data after which the sound shall be played.
This octet shall be coded as an integer value in the range 0 (beginning of the SM data) to the maximum number of characters included in the SM data of one single SM or one segment of a concatenated SM.

Octet 2 Sound number. Shall be encoded as an integer value."

- User defined sounds or iMelody

The format of the iMelody is constituted of a header, the melody and a footer.

Header :

Description	**Example**
"BEGIN:IMELODY"<cr><line-feed>	"BEGIN:IMELODY"
"VERSION:"<version><cr><line-feed>	"VERSION:1.0"
"FORMAT:"<format><cr><line-feed>	"FORMAT:CLASS1.0"

Footer :

Description
"END:IMELODY"<cr><line-feed>

Melody :

Description
“MELODY:”<melody><cr><line-feed>

The melody is composed as follow:

<melody> ::= { <silence> | <note> | <led> | <vib> | <backlight> | <repeat> }+

<led> ::= “ledoff” | “ledon”

<vibe> ::= “vibeon” | “vibeoff”

<backlight> ::= “backon” | “backoff”

<repeat> ::= “(“ | “)” | “@”<repeat-count>

<repeat-count> ::= “0” | “1” | ...

<silence> ::= “r”<duration>[<duration-specifier>]

<note> ::= [<octave-prefix>]<basic-ess-iss-note><duration>[<duration-specifier>]

<duration> := “0” | “1” | “2” | “3” | “4” | “5”

<duration-specifier> ::= “.” | “:” | “;”

<octave-prefix> ::= “*0” | “*1” | ... | “*8” (A=55Hz) | (A=110Hz) | ... | (A=14080Hz)

<basic-ess-iss-note> ::= <basic-note> | <ess-note> | <iss-note>

<basic-note> ::= “c’” | “d” | “e” | “f” | “g” | “a” | “b”

<ess-note> ::= “&d” | “&e” | “&g” | “&a” | “&b”

<iss-note> ::= “#c” | “#d” | “#f” | “#g” | “#a”

Duration

Value	Duration
0	Full-note
1	½-note
2	¼-note

* : Mobile Services version

3	1/8-note
4	1/16-note
5	1/32-note

Duration Specifier

Value	Duration
	No special duration
.	Dotted note
:	Double dotted note
;	2/3 length

The octave prefix only applies to the immediately following note. If not specified, the default octave-prefix is *4. I,e, A=880Hz.

The repeat blocks cannot be nested in this simple CLASS1.0 definition.

The default character set is UTF-8.

The maximum length for a melody is 128 bytes (this includes the melody header and footer).

Example of a «CLASS1» IMelody object:

BEGIN:IMELODY VERSION:1.0 FORMAT:CLASS1.0
MELODY:&b2#c3–c2*4g3d3+#d1r3d2e2:d1+f2f3.
END:IMELODY

- Example

Example of the following message :
(Melody2)(Anim1)(Anim2)HELLO(Picture1)(Anim2)HERE(Melody1)A TEST OF CONCATENATED(Anim1)MESSAGE(Picture2)(Melody2)

Picture 1 : Large Picture
Picture 2 : Variable picture, dx=16, dy=4

* : Mobile Services version

Mel1: melody with basic notes = 87 bytes
Mel 2 : predefined sound “clap”
Anim1 : predefined animation “WOW”
Anim2 : predefined animation “I am glad”

For the first part of the SMS, these TPDU Parameters has to be filled as follow:
-TP-UDHI =1 (to indicate there is a User Data Header)
- TP-PID = 00 (as a normal SMS)
- TP-DCS = 00

For the second part of the SMS, here is the TP User Data concatenated content with the position for each “Content” IE:

SMS n°1:

UDHL = 1 byte	IE Concat = 5 bytes	IE Mel 2 Pos : 0 =4 bytes	IE Anim1 Pos : 0 = 4 bytes	IE Anim2 Pos : 0 =4 bytes	Text =5	= 117 bytes free

SMS n°2:

UDHL = 1 byte	IE Concat = 5 bytes	IE Picture 1 Pos : 0 =131 bytes	= 3 bytes free

SMS n°3:

UDHL = 1 byte	IE Concat = 5 bytes	IE Anim2 Pos : 0 =4 bytes	IE Mel1 Pos : 4 = 90 bytes	IE Anim1 Pos : 26 =4 bytes	Text =33	= 1 bytes free

SMS n°4:

UDHL = 1 byte	IE Concat =5 bytes	IE Picture 2 Pos : 0 = 35 bytes	IE Mel2 Pos : 0 =4 bytes	= 95 bytes free

Here is the details for IE Picture 1 :

IEI = 12	IEDL = 04	Pos : 0	Dx = 16	Dy = 4	Data = 128 bytes

* : Mobile Services version

3.2.2 User Data

The User Data part includes only text (according to TP DCS parameters). The alphabet that can be used :

- UCS2 (16 bits), this alphabet is used for encoding complex sets of symbols such as Arabic and Asian languages. With this alphabet, each message segment can contain up to 70 symbols.
- GSM 7 bit default alphabet. With this alphabet, each message segment can contain up to 160 characters.

END OF DOCUMENT

* : Mobile Services version