ALCATEL's ONE TOUCH™ 525

ENHANCED MESSAGING SERVICE REFERENCE MANUAL

SW/BG3/REFMAN/EMS - Document issue 1.0


ALCATEL

Document History

Version	Date	Type of modification
0.1	10/04/2002	Creation of the draft.
0.2	31/05/2002	Modification after review
1.0	05/06/2002	Initial release

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1 INTRODUCTION

This document will introduce service and content providers with the choices made by Alcatel in terms of technical specifications and ergonomics when designing the ONE TOUCH™ 525. This information will be particularly useful to developers who intend to create EMS objects specifically designed for the ONE TOUCH™ 525.

2 References

2.1 Requirements

This document is NOT a description of the SMS and EMS standards, which are considered the minimum knowledge to fully understand these guidelines. The public meant to read this document includes software and content developers, operators, service providers and marketing teams involved in any decision-making process around the high potentialities of Enhanced Messaging Services.

To know more about EMS as a transport protocol, please refer to the reference documents listed in section 2.

2.2 Documents

Document Title	Reference Name	
Developer Support Guidelines for the Enhanced Messaging Service	February 2002	v1.0
Technical realization of the Short Message Service	3GPP TS 23.040 (Rel 4)	v4.6.0
Technical realization of the Short Message Service	3GPP TS 23.040 (Rel 5)	v5.3.0
IrDA Specifications for Infrared Mobile Communications	i-Melody	v1.2
Technical realization of the Short Message Service PP (Point to Point)	ETSI TS 100 901	v7.2.0
Data Formats for Alcatel Mobiles	FRD_DATA_FORMAT_V3.0	v3.0
TDD Download over SMS	FRD_DownloadOverSMS_V1_0	v1.0
Download over WAP	FRD_DownloadOverWap_V3_0	v3.0

2.3 Links

The latest WAP specifications are available at http://www.wapforum.org. The latest Infrared Mobile Communications specifications are available at http://www.irda.org.

Additional information and tools for developers are available with Alcatel's One Touch™ Ahead program accessible at http://www.alcatel.com/wap/ahead/index.htm.

2.4 Glossary

3GPP	Third Generation Partnership Project
CR	Carriage Return
EMS	Enhanced Messaging Service
ETSI	European Telecommunications Standards Institute
GSM	Global System for Mobile communications
IE	Information Element
IEI	Information Element Identifier
IED	Information Element Data
IP	Internet Protocol
IrDA	Infrared Data Association
MMI	Man-Machine Interface
ODI	Object Distribution Indicator
OTAP	Over the Air Provisioning
PPP	Point to Point Protocol
RAS	Remote Access Server
SIM	Subscriber Identity Module
SM	Short Message
SMS	Short Message Service
SMSC	SMS Center
TCP	Transmission Control Protocol
TP	Transfer Protocol
TP-UD	Transfer Protocol - User Data
UD	User Data
UDH	User Data Header
UDI	Unrestricted Digital Information (digital access mode)
URL	Uniform Resource Locator
WAP	Wireless Application Protocol
WBMP	Wireless Bitmap
WBXML	WAP Binary XML
WCMP	Wireless Control Message Protocol

3 HANDSET OVERVIEW

3.1 Handset characteristics

Figure 1: Alcatel's ONE TOUCH™ 525

3.2 Supported EMS features

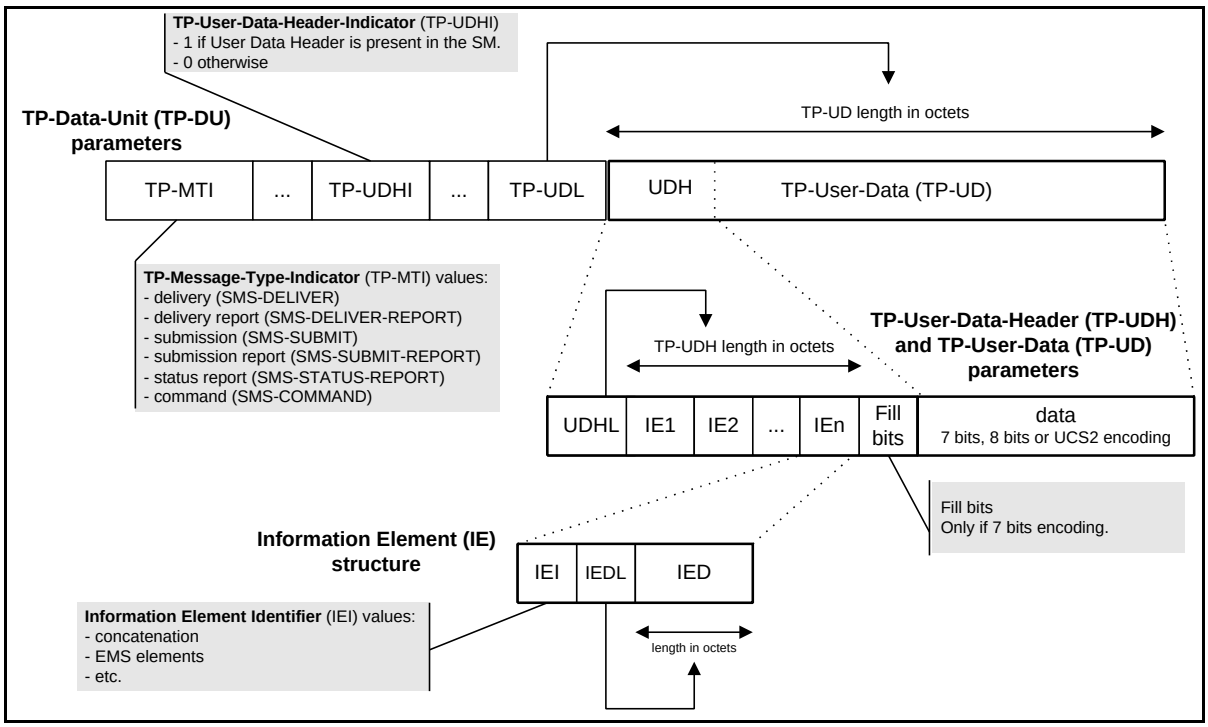
Release 4 features		Release 5 features	
Text formatting:	NO	Extended Object:	NO
Predefined sounds:	**YES**	Reused Extended Object:	NO
User-defined sounds:	**YES**	Compression Control:	NO
Predefined animations:	**YES**	Object Distribution Indicator:	**YES**
User defined animations	**YES**	Standard WVG object:	NO
Large animations:	**YES**	Character size WVG object:	NO
Small animations:	**YES**		
Large pictures:	**YES**		
Small pictures:	**YES**		
Variable pictures:	**YES**		
User Prompt Indicator:	NO		

4 EMS Encoding

This chapter is a brief overview of the structure of the EMS SMS. For complete information on the EMS standard, please refer to the latest documents available on the 3GPP and ETSI web sites.

An SMS can be divided into several parts:

- the entire SMS includes:
  - ✓ the TPDU parameters in the SMS Header
  - ✓ the SMS content
- the SMS content is itself divided in two parts:
  - ✓ the User Data Header (which includes different elements).
  - ✓ the User Data (which includes text only).

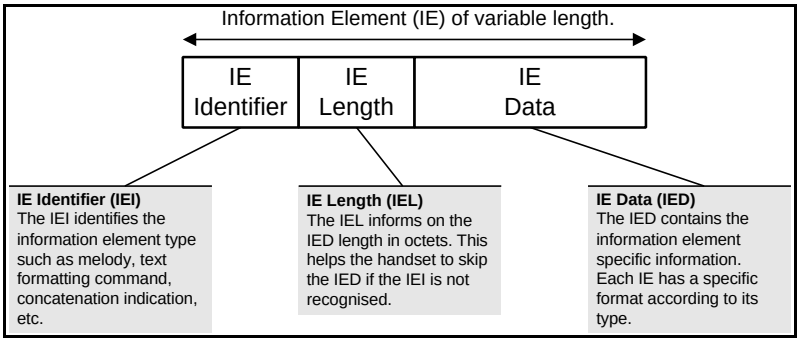


5 User Data Header

Message concatenation is to essential to EMS messaging in order to provide the value-added services the user expects (high quality animations, sounds and pictures).

The ONE TOUCH™ 525 handles EMS short messages of up to TEN (10) segments.

The IEI and associated IEI length and IEI data shall be present in every segment of the concatenated SM. The definition of the User-Data-Length (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.



The "Length-of-User-Data-Header" 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 (see text below). Information Elements may appear in any order and need not necessarily follow the order used in the present document.

The Information Element Identifier octet is coded as follows (supported features are **bolded**):

VALUE (hex)	MEANING	CLASSIFICATION	RELEASE
0A	Text Formatting	EMS Control	4
0B	**Predefined Sound**	EMS Content	4
0C	**User Defined Sound**	EMS Content	4
0D	**Predefined Animation**	EMS Content	4
0E	**Large Animation**	EMS Content	4
0F	**Small Animation**	EMS Content	4
10	**Large Picture**	EMS Content	4
11	**Small Picture**	EMS Content	4
12	**Variable Picture**	EMS Content	4
13	User Prompt Indicator	EMS Control	4
14	Extended Object	EMS Content	5
15	Reused Extended Object	EMS Control	5
16	Compression Control	EMS Control	5
17	**Object Distribution Indicator**	EMS Control	5
18	Standard WVG Object	EMS Content	5
19	Character size WVG Object	EMS Content	5
1A	Extended Object Data Request Command	EMS Control	5

6 SUPPORTED EMS FEATURES

The EMS standard allows the user to send or to receive by SMS formatted text, pictures, animations and sounds. For complete information on the EMS standard, please refer to the documents listed sections 2.2 and 2.3. This section presents the different EMS features and their level of support by the ONE TOUCH™ 525.

Phones which do not support the EMS standard will display the message's text only: the other information (pictures, sounds) will be ignored. This enables the user to access the crucial information (the text) whatever the handset he is using.

6.1 Text formatting

Text formatting enables the user to write messages with different styles, sizes and alignment of text (text formatting instructions are sent with the message). This feature is **NOT** supported by Alcatel's ONE TOUCH™ 525.

6.2 Sounds

There are two kinds of sounds: predefined and user-defined. User-defined sounds in EMS are coded according to the iMelody format.

Alcatel's ONE TOUCH™ 525 supports IrDA's iMelody 1.0, 1.1 and 1.2. The complete iMelody consists of a header, the iMelody data and a footer (case 1, the standard). **The ONE TOUCH™ 525 also recognizes simplified iMelody objects** (cases 2 and 3):

1. Full header and footer	BEGIN:IMELODY VERSION:1.0 FORMAT:CLASS1.0 <iMelody> END:IMELODY
2. Partial header, footer	BEGIN:IMELODY <iMelody> END:IMELODY
3. No header and no footer	<iMelody>

6.2.1 Predefined sounds

There are **ten predefined sounds**. The iMelody code of these sounds is not transferred over the air interface, only the identification of them, saving valuable space in messages. Ten different predefined sounds that can be added to the message.

Sound number	Description	Alcatel pre-defined usage
0	Chimes high	
1	Chimes low	
2	Ding	
3	TaDa	
4	Notify	Received SMS
5	Drum	ON/OFF screens
6	Claps	
7	Fanfare	
8	Chord high	
9	Chord low	

For 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.

6.2.2 User-defined sounds

The sender can define his/her own melodies according to the iMelody format. These monophonic melodies are transferred in the short message and can take up to 128 bytes. A built-in melody composer enables the user to compose a new melody or to edit existing melodies.

The user can compose 2 melodies (up to 10 seconds each), using up to 8 different instruments (out of 11 available instruments). Please refer to the *ONE TOUCH™ 525 User's Guide* to discover how to compose a melody.

Alcatel's ONE TOUCH™ 525 supports the following iMelody features:

Durations:	0; 1; 2; 3; 4; 5 (from FULL NOTE to 1/32-NOTE).
Flat note:	YES
Sharp note:	YES
Rest:	YES
Notes:	0 to 11 (from "c" to "b").
Octaves:	0; 1; 2; 3; 4; 5; 6; 7; 8 (all octaves).
Beat:	YES
Style:	IGNORED
Volume modifier:	IGNORED
Duration specifier:	IGNORED
LED, Vibe, Repeat:	IGNORED

6.3 Animations

An animation is a sequence of static pictures associated with a display time. As with sounds and pictures, animations can be predefined or user-defined.

6.3.1 Predefined animations

There are **fifteen predefined animations** or "smileys". These animations are not sent over the air interface but only their identification (the "animation number"). Predefined animations correspond only to meaning (the "description"): their actual design is specific to each manufacturer.

The table below shows the way Alcatel's ONE TOUCH™ 525 displays these animations:

Animation number	Description	Smiley small font	Smiley big font
0	I am ironic, flirty		
1	I am glad		
2	I am skeptic		
3	I am sad		
4	WOW!		
5	I am crying		
6	I am winking		
7	I am laughing		
8	I am indifferent		
9	In love / Kissing		
10	I am confused		
11	Tongue hanging out		
12	I am angry		
13	Wearing glasses		
14	Devil		

For pre-defined 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.

6.3.2 User-defined animations

User-defined animations consist of **4 pictures** and there are two possible sizes: small (8 x 8 pixels) and large (16 x 16 pixels). These animations are sent over the air interface.

For 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.

6.3.2.1 Small animations

Small animations consist of four pictures of **8 x 8 pixels**, as illustrated in the examples below:

CRY

SMILE

6.3.2.2 Large animations

Large animations consist of four pictures of **16*16 pixels**, as illustrated in the examples below:

ALIEN

CRY

DANCE

SMILE

LOL

6.4 Pictures

It is possible to include either small pictures (16 x 16 pixels), large pictures (32 x 32 pixels) or pictures of variable sizes. To be used in an EMS message, such pictures must respect the rules below:

- No animation.
- No gray scales (black and white only).
- The picture must be at least 8 pixels (width) x 1 pixel (height).
- Picture size no larger than 128 bytes.

To calculate the 128-byte limit, apply the following formula:

(W/8) x H =< 128

Where **W** is the *width* in pixels and **H** the *height* in pixels. For example, a 32 x 32 picture fits this requirement ([32/8] x 32 = 128). **W** must be a **multiple of 8**.

6.4.1 Fixed pictures

Fixed pictures can be either small (16 x 16 pixels) or large (32 x 32 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 colors or gray scales are supported. The bitvalue "0" represents a white pixel and the bitvalue "1" represents a black pixel.

Example of 16 X 16 picture

Byte 1	Byte 2
Byte 3	Byte 4
...	...
...	...
Byte 31	Byte 32

6.4.1.1 Small pictures

Small pictures are 16 x 16 pixels, as illustrated in the examples below:


ALIEN


LAUGH


DANCE

6.4.1.2 Large pictures

Large pictures are 32 x 32 pixels, as illustrated in the examples below:


CONCERT


DOC


PIG


OK


SPORT

6.4.2 Variable pictures

It is also possible to include pictures of variable sizes. To be used in an EMS message, such pictures must respect the rules below:

- No animation and no gray scales (black and white only).
- The picture must be at least 8 pixels (width) x 1 pixel (height).
- Picture size no larger than 128 bytes.

To calculate the 128-byte limit, apply the following formula:

(W/8) x H =< 128

Where **W** is the *width* in pixels and **H** the *height* in pixels. For example, a 32 x 32 picture fits this requirement ([32/8] x 32 = 128). **W** must be a **multiple of 8**.

Considering these rules, Alcatel recommends the following formats, which offer a good balance:

- **40 x 25 pixels**, as in the examples below:


CINEMA


MUSIC


EXCLAMATION


FLOWER


HEART


GIRL


QUESTION


PRESENT


DRINK


FOOD


SHOPPING

- **64 x 16 pixels**, as in the examples below:


LATE


TRAFFIC


AMBULANCE

For variable sizes pictures, 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.

6.5 User Prompt Indicator

The User Prompt Indicator (UPI) is a downloading feature which requires the user to either accept or reject the download. It also allows to send larger objects by stitching several small objects of the same type. Alcatel's ONE TOUCH™ 525 does **NOT** support this feature.

6.6 Object Distribution Indicator

The Object Distribution Indicator (**ODI**) is a Release5 TP-UDH Information Element. This downloading feature allows content providers to prevent EMS objects from being redistributed using the SMS bearer. **Such "copyrighted" objects can not be forwarded to other handsets** by the user who first downloaded it. The ODI indicator is described in the 3GPP TS 23.040 standard. Please refer to that standard for full information on the indicator's format.

ODI applies to user-defined pictures (small, large and variable), user-defined sounds (melodies) or user-defined animations. ODI attributes are stored in the handset with the downloaded object. However, the user is not aware of the protection status of an EMS object (neither on display nor on storage). ODI-protected objects can be used only locally in the phone (pictures used as "wallpapers", melodies used as "on/off" sounds, etc.).

The ODI controls the redistribution of subsequent EMS objects in the message. From the strict ODI point of view, an inserted EMS object inherits one of these two ODI statuses:

- **ODI-unprotected:** the EMS object belongs to a complete message, and is out of ODI scope, or within the scope of an ODI "may be forwarded by SMS".
- **ODI-protected**: the EMS object belongs to an incomplete message, or is within the scope of an ODI "shall not be forwarded by SMS" in a complete message.

The SDM variable "**sms_forward_ems_data**" is specific to EMS extraction. It is **FALSE by default** (the object CAN be forwarded). When set to FALSE, the EMS object extracted from an incoming EMS message CANNOT be forwarded by EMS. When set to TRUE, it can be forwarded.

The table below describes the resulting EMS sending permission for **Release 4** contents.

Release 5 contents are **NOT** recognized by the ONE TOUCH™ 525: any R5 EMS object will therefore be ignored (only recognizable parts of the message will be displayed).

EMS content	**ODI status**	**Customization Flag** "sms_forward_ems_data"	→	**PERMISSION** (sending rights)
R4 Small Picture R4 Large picture R4 Variable picture R4 Small animation R4 Large animation R4 iMelody	ODI- unprotected	TRUE		YES
		FALSE		**NO**
	ODI-protected	-		
R5 Bitmap B & W R5 Bitmap 2-bit grayscale R5 Bitmap 6-bit color R5 Anim B & W R5 Anim 2-bit grayscale R5 Anim 6-bit color R5 vCard R5 vCalendar R5 Standard WVG R5 Character Size WVG	-	-		**N/A**

7 WRITING EMS MESSAGES

Writing EMS messages with the ONE TOUCH™ 525 is as simple as writing a regular SMS: the user-friendly MMI is intuitive and the user can accelerate the writing by using the Zi predictive mode (with an embedded dictionary).

The user can send:

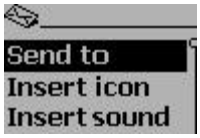
- Text only (without or without predefined smileys).
- An picture / animation only.
- A sound only.
- A text (without or without predefined smileys) with a picture and/or a sound.
- A full EMS message with a combination of text, smileys, pictures and sounds.

7.1 Using the messages menu

To access the message writing interface, select the **Messages** item in the handset's **Menu**, as illustrated below.

The user can use the **contextual menu** to insert EMS objects in the message.

This menu includes the items below:



- Send to.
- Insert **Icon** (to insert a **user-defined animation/picture**).
- Insert **Sound** (to insert a predefined **sound** or a user-defined **melody**).
- Insert **Smiley** (to insert a **predefined animation**).
- **Preview** (to display the message before sending it).
- Save message (to save the message and send it later).
- Predictive mode items (other words, insert digits, punctuation, normal mode, add word, language)

The preview item enables the user to see the message the way it will be displayed to the recipient. Indeed, when writing the message, inserted EMS objects are represented by an "iChar", a small design used to save space and to make writing easier, as illustrated below:

7.2 Inserting EMS objects

The ONE TOUCH™ 525 simplifies EMS writing. The user types the text (possibly using the built-in predictive entry mode) and adds EMS objects where desired.

1. While writing, press OK to display the contextual menu.
2. Select a type of object (icon/animation, sound, smiley).
3. Scroll through the list of objects until the desired picture/melody/smiley is displayed.
4. Press OK to confirm and insert the displayed object, as illustrated below.

7.2.1 Insert an user-defined animation/picture

The inserted animation/picture is not displayed when composing the message and is replaced by an "iChar". Use the **Preview** item in the contextual menu to display the message as it will appear to the recipient.

7.2.2 Insert an sound/melody

7.2.3 Insert an smiley/animation

Predefined animations ("smileys") are managed as regular characters and are therefore displayed in the message when writing.

End of document