Developers Guidelines

Sony Ericsson Themes

Sony Ericsson

Preface

Purpose of this document

This document describes how to implement themes for Sony Ericsson mobile phones.

The document is intended for content providers who want guidelines to optimally create themes and the elements required to create an appealing theme.

People who can benefit from this document are:

- Software developers
- Content providers
- Operators and service providers

It is assumed that the reader is familiar with different graphic and sound formats.

More information, useful for product, service, and application software developers, is published on the Sony Ericsson Developer World (www.SonyEricsson.com/developer) contains up-to-date information about technologies, products, and tools.

Online Developer Resources

On Sony Ericsson Developer World, http://www.SonyEricsson.com/developer, developers will find all documentation and tools such as phone White Papers, Developers Guidelines, SDKs and APIs, and so on. The developer web site also contains discussion forums monitored by our Sony Ericsson Developer Support team, a searcheable Knowledge Base of support queries and solutions, Tips & Tricks, example code, and so on. To stay up to date on development issues, register and subscribe to the monthly Sony Ericsson Developer Newsletter.

Sony Ericsson Developer Support

Sony Ericsson offers developers professional technical support services. The service can be purchased from the developer web portal, as part of the Sony Ericsson Core and Core+ membership package or as individual support incidents. There are two levels of support, described below.

The **Basic E-mail Developer Support** is an annual support service included in the Core membership that provides developers with all the basics to successfully develop world-class applications for Sony Ericsson products. With this support contract, developers get access to Sony Ericsson developer support engineers via email with same-day response, five technical support incidents as well as the ability to purchase more.

The **Priority E-mail Developer Support** is an annual support service included in the Core+ membership that equips professional developers with everything they need to successfully develop world-class applications for Sony Ericsson products. With this support contract, developers get priority access to Sony Ericsson developer support engineers via email with fast response times and up to 50 technical support incidents.

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Document conventions

Products

Sony Ericsson mobile phones are referred to in this document using generic names as follows:

Generic names Series	Sony Ericsson mobile phones
T68	T68i
T230	T226, T230, T238
T300	T300, T302, T306, T308
T310	T310, T312, T316
T610	T610, T616, T618
T630	T628, T630, T637
Z600	Z600, Z608
Z1010	Z1010
K700	K700i, K700c
S700	S700i, S700c, S710a
K500	K500i, K506c, K508i, K508c, F500i
Z500	Z500a, Z500i
P900	P900, P908
P910	P910a, P910i, P910c

Typographical conventions

In this document code examples are written in Courier font:

```
<textColor id="operator" text="#000000" outline="#9CCE9C"></ textColor>
```

Terminology and abbreviations

Term	Explanation
JPEG	Joint Photographic Experts Group.
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
XML	eXtensible Markup Language

Document history

Change history		
2004-01-19	Version R1A	First Edition
2004-03-02	Version R2A	Second edition. Added K700 info
2004-03-27	Version R3A	Third edition. Editorial changes for K700 image size
2004-09-20	Version R4A	Fourth edition. Added info for S700, K500 and Z500

Contents

Themes architecture

This chapter contains general information about themes in Sony Ericsson mobile phones. Specific information about theme formats and specifications for different phone models and theme versions can be found in the appendices of this document.

Themes introduction

A theme is a way to change the graphical experience for the user in just one setting.

When the user selects to use a theme, the following user interface details may be affected:

• Colours of graphical elements (backgrounds, shadows, highlights, and so on).
• Pictures used as backgrounds for graphical elements.
• Sounds used for different alerts and events.

Which elements that may be affected by themes depends on the mobile phone model. At delivery a number of themes are pre-loaded into the phone. More themes can be achieved, for example through an Internet connection, via MMS, or from a computer connected to the phone via Infrared, serial/USB cable or Bluetooth™ wireless technology.

Theme files for Sony Ericsson phones, except for the P900/P910, are TAR archives with the file extension .thm. A theme file contains at least an XML file, in which colour settings for graphical elements and option- ally image file names and audio file names are defined. If the XML file specifies image or audio file names, the specified files are also included in the archive. To extract the individual files from THM theme files most standard archiving applications on the market can be used.

For the P900/P910 a theme file is a ZIP archive with file extension .utz. The archive contains an XML file specifying colour settings, images and sounds used in the theme, together with a number of image and audio files.

Compatibility between different Sony Ericsson mobile phones

Not all Sony Ericsson mobile phones support the same theme format. The main differences are the screen size and what elements are included in the theme. Another difference is the support for image formats (GIF, JPEG, PNG, MBM).

For Sony Ericsson mobile phones other than the P900/P910, standard image formats, GIF, JPEG and PNG are used.

For the P900/P910, a Symbian™ specific file format called "MultiBitMap" file (MBM) is used for certain images in a theme. MBM files are native Symbian OS format. MBM files can consist of one or multiple images.

Three themes versions exist for Sony Ericsson mobile phones, apart from the P900/P910, who has its own theme format. In the table below, phone models, themes versions and screen sizes are listed. For more details and specifications for the different themes versions and phone models, refer to the appendices of this document.

Phone series/model	Theme version	Screen size (WxH) pixels	No. of colours
T68, T300, T310	ver 1.0	101x80	256 colours
T226	ver 1.0 extended	101x80	512 colours

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Phone series/model	Theme version	Screen size (WxH) pixels	No. of colours
T230	ver 1.0 extended	101x80	4,096 colours
T610, T630 and Z600	ver 2.0	128x160	65,536 colours
Z1010 and K700	ver 3.0	176x220	65,536 colours
S700	ver 3.0	240x320	262,144 colours
Z500, K500	ver 3.0	128x160 Z500 external screen: 96x64	65,536 colours 4,096 colours
P900/P910	Symbian specified theme format	Flip open: 208x320 Flip closed: 208x208	65,536

Theme MIME types

file extension	MIME type	
.thm	application/vnd.eri.thm	MIME type for Sony Ericsson T68, T300, T310, T230, T610, T630, Z600, Z1010, K700, S700, K500 and Z500 themes
.utz	application/vnd.uiq.thm	MIME type for Sony Ericsson P900/P910 themes

Sony Ericsson Themes Creator

Sony Ericsson Themes Creator is a personal computer based application that allows users to personalize the 'look and feel' of the Sony Ericsson mobile phones. The application allows you to create new themes, edit an existing theme and save a theme.

The Themes Creator application is available for download at Sony Ericsson Developer World.

The Sony Ericsson Theme Creator application helps you to create/compose themes which are compatible with Sony Ericsson mobile phones. The application is not a graphic editing tool, but more of a 'composer', that is, it enables you to create a theme based on existing components (sound files, image files, and so on.). It also allows you to change display colours for menu text, clock display, and so on.

The image below shows the main window of the Themes Creator application, with the K700 phone selected for theme editing and preview.

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The most important features of the Themes Creator are:

- In the **File** menu the phone model to work with can be changed, existing theme files can be opened and the current theme can be saved.

- The **tabs** are used to select group of theme elements to edit. In the example below, the Standby screen is selected.

- The list selector is used to select which display element to edit. For images the recommended size is displayed.

- The **Import...** button is used to select an image for the current element. When the button is pressed, a "File open" dialog is displayed so the wanted image can be selected.

- Colour settings for text items, outlines and backgrounds can be entered directly into the text fields or selected via a "Colour" dialog, displayed when a colour button is pressed. The scrollbar to the right of the colour settings is displayed when more settings are available than can be viewed in the window.

- Image and colour changes are immediately reflected in the preview image to the right. Pressing the **Preview all** button shows the appearance of all different screens with currently selected images and colours.
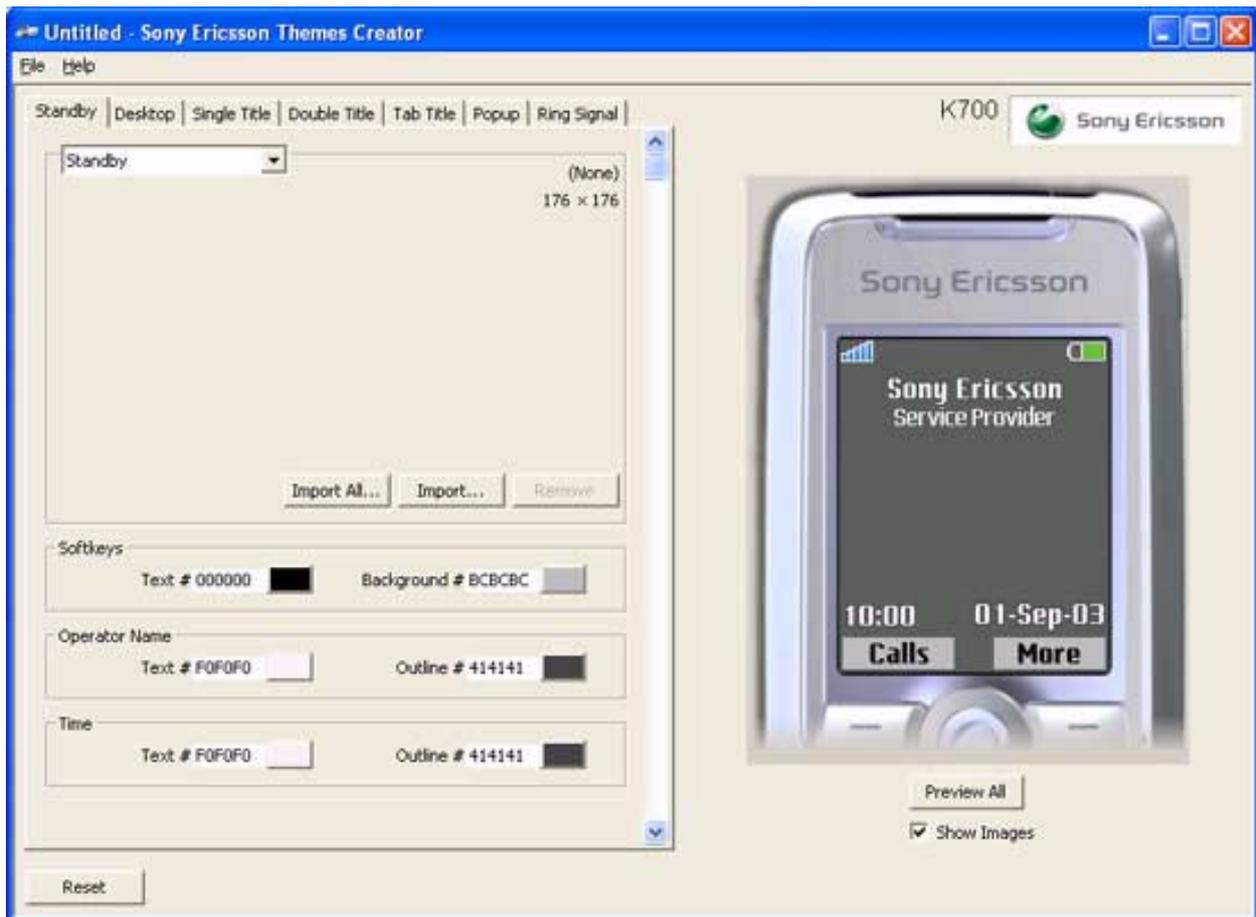
Characteristics and limitations of the Themes Creator

- When launching the application for the first time, you will be asked to choose a phone model. This will be the mobile phone model used when previewing the current theme in the application. Of course a theme can be saved for one phone model and be opened in another mobile phone preview, as long as they belong to the same theme version see the specifications table on page 8.

- The application remembers the last mobile phone model that was used before closing a Themes Creator session. When a theme file (*.thm or *.utz) is opened in the Windows Explorer, an error might occur becuse the opened theme file is not compatible with the current phone model. Therefore, it is recommended to first start the Sony Ericsson Themes Creator, then choose the appropriate mobile phone model, and finally open the theme file.

- Due to resolution and colour depth differences between the computer and the phone, the preview pane of the Sony Ericsson Themes Creator can be slightly different compared to what is displayed in the mobile phone. Differences may also depend on market or operator customizations of the phone.

- The Symbian graphic format (MultiBitMap – MBM) is required for the P900/P910 theme to provide the graphical effects of the mobile phone. The application converts MBM files in opened theme files to BMP files which are displayed in the preview pane of the Sony Ericsson Themes Creator. Therefore, the appearance of the MBM skins might differ from the appearance in the actual P900/P910 devices.

  For more information about MBM files, refer to the Symbian publication "Symbian OS C++ for Mobile Phones" by Richard Harrison.

- If a P900/P910 theme (not created in the Themes Creator) is opened and an MBM file does not contain the correct number of bitmaps, these bitmaps will not be shown in the applications.

- If not all bitmaps for an MBM file are present in the Themes Creator when saving the theme, a warning message is displayed. If the warning is ignored, and the theme is saved, this specific MBM file will not be included in the theme.

Theme design recommendations

- To make a theme for different Sony Ericsson mobile phones, it is advised that images for for all desired elements in all these phone models are created. Please refer to the appendices of this document for information on which elements can contain images, together with image sizes and colour depths. Use the Themes Creator to import images, set colours for other elements, and save a theme file for each of the different phone models.
  However, it is not necessary to create images for all items, since colour settings can be applied for any element if preferred. When the phone model is selected, default colours are set for all theme elements.

- If images are to be used for wallpaper and desktop background, they must be of the defined size. Otherwise the images will not be displayed correctly or, in worst case, the mobile phone will not be able to install the theme.

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Creating images

For creating pictures and image components, use any standard commercially available image editing application, for example Adobe® Photoshop®.

When creating images for themes, the following must be taken into consideration:

- The colour depth of the mobile phone: 256, 512, 4K, 65K or 262K colours
- The height and width of the image.
- Images must be valid GIF/JPEG/PNG/MBM/BMP files (depending on the themes version of the phone, see the specifications in the appendices of this document). If one file is corrupt the whole theme file will be treated as corrupt.
- When using JPEG files, make sure that the files are converted/saved to JPEG format from images with 24-bit colour depth. Otherwise, the theme will be considered invalid and can not be installed in the phone.

Note:
Images are not always required for elements that allow images. Using an image file results in a larger theme file. In many cases, a colour attribute is sufficient for making the theme look good.

Element colours

The Sony Ericsson Themes Creator starts with a default set of colours for all required theme elements. It is up to the user to change the colours he wants.

Colour selection

When selecting colours for certain elements of a theme, colours of some pairs and some triplets of elements must be chosen so that the user clearly can see the elements on the phone display. The RGB distance (see below) between elements need to be at least 20 for themes version 1 and 2, at least 12 for themes version 3, to allow a user to see the colour difference on the screen.

When a colour setting for an element that need to be separable from other elements is changed in the Themes Creator, the RGB distance between the colours is calculated. Small red triangles near the colour buttons indicate that the current values are invalid, that is too close in colour. The theme can still be saved after a warning message, but the theme can not be installed in a phone.

RGB distance calculation

If the Themes Creator is not used for creating a theme, the RGB distance should be calculated to verify that colours are distinguishable. The following example shows how to calculate the RGB distance between to colours.

Note: For phones with 256, 512 or 4096 colour displays, element colour pairs may in rare cases become invalid even if the RGB distance is greater than 20. This is because the colours are converted into the screen's palette, and two colours that are separable in RGB mode may be converted into palette colours that are not.

Example:

To calculate the RGB distance between two blue colours, RGB(0,67,140) and RGB(0,82,164):

1. Calculate the differences between Red, Green and Blue colour values separately and calculate the square of the differences.
   Red difference = 0 – 0 = 0
   Blue difference = 82 – 67 = 15
   Green difference = 164 – 140 = 24

2. Add the squares of the three colour differences together:
   $0^2 + 15^2 + 24^2 = 0 + 225 + 576 = 801$

3. The RGB distance is calculated as the square root of the sum of squares above:
   RGB distance = $\sqrt{801}$ = 28.3

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Appendix 1
– Themes version 1.0

This appendix contains theme specifications for the Sony Ericsson T68, T300, T310 and T230.

Image files in themes

The table below lists theme elements where images may be used and sizes of these images in pixels.

Element	T68 T300 T310	T230	Comment
Phone specifications			
Screen size	101x80	101x80	
No. of colours	256	4,096 (**T226**: 512)	
Supported image file formats	GIF	GIF	File extension must be .GIF. JPEG is *not* supported for theme version 1.0 images, even for phones that support JPEG, for example for wallpapers.
Standby			
Background	101x80		If the Image is larger than 101x80 it is cut from the bottom/right, if it is smaller it is centered on the screen.
Desktop			
Desktop Background	101x80		If the Image is larger than 101x80 it is cut from the bottom/right, if it is smaller it is centered on the screen.
Navigation			
Title (Small)	101x20		When an image is used for this element, two rows of text with *small* font can be displayed in the title, which gives less room for menu items. Only in menus, not in applications.
Title (Medium)	101x27		When an image is used for this element, two rows of text with *medium* font can be displayed in the title, which gives less room for menu items. Only in menus, not in applications.
Title (Large)	101x16		Only room for one row with *large* font in the title
Title (Asian)	101x16		Same as Title (Large) for Asian phones.
Highlight (Small)	N/A	101x10	Background for highlighted items with *small* font.
Highlight (Medium)	N/A	101x13	Background for highlighted items with *medium* font.
Higlight (Large)	N/A	101x16	Background for highlighted items with *large* font.
Highlight (Asian)	N/A	101x16	Same as Highlight (Large) for Asian phones.
Datalist Image	N/A	101x80	Background picture used in menus. This image will be obscured by Title and Highlight bar.

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Note: The colour palette used for the GIF conversion has great impact on the quality of theme images. The Developers Guideline *Adapting images for Sony Ericsson phones* contains instructions how to optimize the 256 colour palette for GIF images to be viewed on phone displays. Particularly, great improvements can be achieved on images for the T226 (512 colour/9-bit) and T230 series (4,096 colour/12-bit) phones. This document can be downloaded from Sony Ericsson Developer World.

Colour setting notes

Colour values are set in hexadecimal format, for example 34D2CC (in the XML file the "0x34D2CC" notation is used). Note that when rendered in the phone, the closest colour in the display's palette is used. Therefore the appearance of colours on the phone display can differ slightly from the appearance in the Themes Creator's preview images.

Some colour settings only have effect on the display when an image is selected for the background. The following colour values are replaced by the **Text** colour setting (set in the *Navigation* tab in Themes Creator) when there is no image in the background:

• Standby Operator Name Text
• Standby Operator Name Outline
• Standby Time Text
• Standby Time Outline

The colour setting Desktop Title Shadow is only used when there is an image for the desktop background.

Appendix 2
– Themes version 2.0

This appendix contains theme specifications for the Sony Ericsson T610, T630 and Z600.

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Image files in themes

The table below lists theme elements where images may be used and sizes of these images in pixels.

Element	T610 T630 Z600	Comment
Phone specifications		
Screen Size	128x160	
No. of colours	65,536	
Supported image file formats	GIF, JPEG	Image files must be valid GIF or JPEG files. If one file is corrupt, the whole theme will be treated as corrupt.
Standby		
Statusbar Background	128x14	
Softkeys Background	128x19	
Wallpaper	128x127	If the Image is larger than 128x127 it is cropped, if it is smaller it is centered on the screen.
Desktop		
Desktop Background	128x127	If the Image is larger than 128x127 it is cropped, if it is smaller it is centered on the screen.
Navigation		
General Background	128x104	
Title	128x23	When an image is used for this element, its height is about two rows, instead of one when the colour setting is used, which gives less room for menu items. The image is shown only in menus, not in applications.
Highlight	123x16	
Popup		
Popup Title	118x23	
Popup Highlight	113x16	

Note: In general JPEG files are smaller than GIF files with the same image size. Which format is used therefore affects the total size of the theme file. A general recommendation is to use GIF files for coloured line art graphics ("cartoon-like images"), and JPEG files for photographic pictures.

Colour setting notes

Colour values are set in hexadecimal format, for example 34D2CC (in the XML file the "0x34D2CC" notation is used). Note that when rendered in the phone, the closest value within the phones 65,536 colour depth will be used. Therefore the appearance of colours on the phone display can differ slightly from the appearance in the Themes Creator's preview images.

Some colour settings only have effect on the display when an image is selected for the background.The following colour values are replaced by the **Text** colour setting (set in the *Navigation* tab in Themes Creator) when there is no image in the background:

- Standby Operator Name Text
- Standby Operator Name Outline
- Standby Time Text
- Standby Time Outline

The colour setting Desktop Title Shadow is only used when there is an image for the desktop background.

Appendix 3
– Themes version 3.0

This appendix contains theme specifications for the Sony Ericsson Z1010, K700, S700, K500 and Z500.

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Image files in themes version 3.0

If no image is used for an element, colour settings will be used instead, see the *Colour setting notes* section below.

The image file format used affects the total size of the theme file. In general GIF files are smaller than JPEG files with the same image size. PNG files always contains full 24-bit colour representation and does not approximate pixel areas as the JPEG format does, which in some cases leads to large files. The PNG format allows semi transparency through alpha channels.

Animations are only supported in GIF format.

A general recommendation is to use GIF files for coloured line art graphics ("cartoon-like images") and animations, JPEG or PNG files for photographic pictures. In many cases it is worth the effort to save an image in different formats and select the smallest file. PNG must be used for images with transparent or semi-transparent areas.

The table below lists theme elements where images may be used and sizes of these images in pixels. In the "Comment" column is noted which images are allowed to be animations and for which elements image transparency is supported.

Element	Z1010	K700	S700	K500 Z500	Comments
Phone specifications					
Screen Size	176x220	176x220	240x320	128x160	**Z500** external display: 96x64
No. of colours	65,536		262,144	65,536	**Z500** external display: 4,096
Supported image file formats	GIF, JPEG, PNG				If one image file is corrupt, the whole theme will be treated as corrupt.
Standby					
Standby (Wallpaper)	176x182	176x176	240x266	128x128	Animation allowed. If the Image is larger than the specification, it is cropped, if it is smaller it is centered in the area
Standby Softkey	176x22	176x26	240x30	128x18	
Standby Statusbar	176x16	176x18	240x24	128x14	Transparency allowed
Desktop					
Desktop	176x182	176x176	240x266	128x128	If the Image is larger than the specification, it is cropped, if it is smaller it is centered in the area

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Element	Z1010	K700	S700	K500 Z500	Comments
Softkeys	176x22	176x26	240x30	128x18	The images or colour settings for these elements are used in all other screens too, except for the Standby screen.
Statusbar	176x16	176x18	240x24	128x14	
Navigation – Single Title					
Title Small	176x19	176x29	240x40	128x20	
Background	N/A	176x147	240x226	128x108	The same background image is used for all Navigation screens.
Highlight	N/A	169x55	233x72	123x39	Transparency (alpha channel) allowed. Placed on top of the Background image.
Navigation – Double Title					
Background	176x42	N/A	N/A	N/A	The same background image is used for all Navigation screens.
Title	176x40	176x52	240x70	128x37	
Highlight	170x51	N/A	N/A	N/A	Transparency (alpha channel) allowed. Placed on top of the Background image.
Navigation – Tab Title					
Tab	176x40	176x52	240x70	128x37	
Tab selected	31x20	35x27	48x39	25x20	Transparency (alpha channel) allowed. Placed on top of the Tab (title) image.
Tab unselected	31x20	35x23	48x33	25x17	Transparency (alpha channel) allowed. Placed on top of the Tab (title) image. Repeated as many times as there are menu items (max 5).
Highlight small	170x28	169x32	233x42	123x20	Transparency (alpha channel) allowed. Placed on top of the Background image.
Popup (and More menu)					
Popup Title	150x32	163x29	209x40	118x20	Transparency (alpha channel) allowed. Placed on top of the Popup image.
Popup Highlight	144x28	156x30	202x42	113x20	Transparency (alpha channel) allowed. Placed on top of the Popup image.

Element	Z1010	K700	S700	K500 Z500	Comments
Popup (background)	150x150	163x152	209x232	118x109	The size of the area where this image is displayed depends on if there is a title and (for More menus) the number of items in the list. The image is cropped if the area is smaller than the image size.
External display – Z500 only					
External	N/A	N/A	N/A	96x64	

Colour setting notes

Colour values are set in hexadecimal format, for example 34D2CC (in the XML file the "0x34D2CC" notation is used). Note that when rendered in the phone, the closest value within the phones colour depth will be used. Therefore the appearance of colours on the phone display can differ slightly from the appearance in the Themes Creator's preview images.

Alpha blended colours

In themes version 3.0 a number of colours are automatically rendered using alpha blending, either as a percentage of the colour setting or as a percentage of black or white.

The following colours are rendered using automatic alpha blending:

Element	Alpha blending	Comments
Standby		
Operator Name Outline	50% of set colour	
Time Outline	50% of set colour	
Secondary Statusbar Background	70% of White (FFFFFF)	Not in XML file. Z500 only.
Softkeys		
Softkeys text shadow	20% of Black (000000)	Not in XML file
Softkeys disabled text	50% of *Softkeys Text*	Not in XML file
Desktop		
Desktop Title Text Shadow	20% of Black (000000)	Not in XML file
General		

Element	Alpha blending	Comments
Title Text Shadow	20% of Black (000000)	Not in XML file
Disabled Text	50% of *Text*	Not in XML file
Highlight Disabled Text	50% of *Highlight text*	Not in XML file
Scrollbar background	50% of set colour	
Popup/More list		
Popup Title Text Shadow	20% of Black (000000)	Not in XML file
Popup Disabled Text	50% of text in More lists	Not in XML file
Popup Highlight Disabled Text	50% of highlighted text in More lists	Not in XML file
Popup Frame Shadow	40% of Black (000000)	Not in XML file
Popup Scrollbar Background	50% of set colour	
Tabs		
Tab Text Shadow	20% of Black (000000)	Not in XML file
Notes		
Notes	70% of White (FFFFFF)	Not in XML file
Notes Text	No blending, always = "000000"	Not in XML file

Ringtones

In the Themes Creator a ringtone can be imported into the theme. Select the Ring signal tab to import the audio file you want. However, not all ringtone formats are perfect for all phones. Please refer to the *Ringtones* Developers Guideline, available for download at [Sony Ericsson Developer World](#).

Appendix 4
– P900/P910 themes

A P900/P910 theme package is a standard zip file with the file extension .utz, containing several files. Some of the files must match the definition given in a XML file in the theme package, while others must match the rules specific to the P900/P910 theme extensions.

Theme package contents

A theme package contains the following files:

Mandatory

- One (1) Theme XML definition in a file with extension .xml.
  This must be present in the package. The format will be explained below.

Optional

- Two (2) wallpaper images (typically JPEGs, but can be any image format handled by the P900/P910 media server – GIF, JPEG or PNG). One of the wallpaper images is for the Flip Open AppLauncher, and one is for the Flip Close standby screen of telephony. The names of these two files are specified in the XML definition file.

- 16 sound files (any audio format supported by the media server – MP3, MIDI or RMF).
  A theme package can contain any combination of these files or none of them. File names are specified in the XML definition file.

- Eight (8) MBM skin files for
  - appicker graphics
  - dialog title bar
  - flip closed title bar
  - appLauncher graphics
  - list box highlight
  - menu bar
  - menu pane
  - status bar

  The name and format of these skin files are **static**, and cannot be defined in the XML definition file. A theme package can contain any combination of the skin bitmap files. The Themes Creator automatically gives the skin files correct names when a theme is saved.

- Three (3) PNGs image files for
  - standby shortcut
  - selected shortcut
  - shortcut's halo.

  A theme package can contain all or none of them. The name of the files are **static**. The Themes Creator automatically names the file correctly when a theme is saved.

- One (1) screensaver image file (**must be a GIF**). File name is **static**. The Themes Creator automatically names the file correctly when a theme is saved.

The XML file

The Theme definition XML file defines the use of the files present in the theme packages and defines the colour scheme to use.

Note:
Elements in the XML file that does not have any PCDATA or sub elements, but only attributes can be written in an abbreviated format. So instead of writing

```
<darkColor background="#003399" text="#FFFFFF"></darkColor>
```

you can write

```
<darkColor background="#003399" text="#FFFFFF"/>
```

The XML file can contain the following elements (example of xml file provided below):

```
<?xml version="1.0"?>
```
(Mandatory element)

```
<!DOCTYPE theme SYSTEM "theme.dtd">
```
(Mandatory element)

```
<theme>…</theme>
```
(Mandatory element)

The <theme> element has the following mandatory attributes:

title: title of the theme (for example `title="my theme"`. Should be the same as the file name of the theme.)
author: author of the theme (for example `author="John Doe"`)
copyright: copyright information (for example `copyright="Sony Ericsson"`)
screenWidth: the screen width of the device for which this theme is intended (`"208"`)
screenHeight: the screen height of the device for which this theme is intended (`"320"`)

```
<wallpaper> filename </wallpaper>
```
Optional element. Defines the wallpaper(s) to use.

The <wallpaper> element has the following mandatory attribute:
id: ID of the wallpaper, identifying which wallpaper the specified file should be used for.

Supported IDs are:
Launcher wallpaper for AppLauncher (`id="Launcher"`).
FcStandby_208x189 wallpaper for standby screen in flip closed.

The suggested sizes for the wallpapers' images are:
Launcher: 208x256 pixels
FcStandby_208x189: 208x189 pixels

PCDATA
filename: name of the file to use for the specified wallpaper (for example wallpaperforest.jpg). The file name can contain a relative path within the theme zip file. The image file can be of any type supported by the media server. If the file is an animation (for example GIF) then only the first frame in the animation will be used as wallpaper.

```
<condensedColorScheme>...</condensedColorScheme>
```
Mandatory element used to define a colourcolor scheme. The condendedColorSheme element has no attributes or PCDATA, but must have the following three sub elements:

```
<darkColor></darkColor>
<midColor></midColor>
<lightColor></lightColor>
```

These 3 elements each have the following mandatory attributes:

- **background**: a string defining a RGB colour (standard HTML hex format), for example `"#316331"`
- **text**: a string defining a RGB colour (standard HTML hex format), for example `"#FFFFFF"`

```
systemSound>filename</systemSound>
```
Optional element
If present, it must contain the following mandatory attribute:
id: id to identify the system sound that should use the specified file.

The supported IDs are (ID + corresponding UI string):

XML ID	UI String
DefaultRing	Ring (voice)
DefaultRingVoice2	Ring (voice) Line 2
DefaultRingData	Ring (data)
MessageNewSMS	New SMS
MessageNewMMS	New MMS
MessageNewEmail	New Email
MessageNewVoiceMessage	New voice message
MessageNewAreaInfo	New area info message
MessageNewAutoSetup	New auto setup
DefaultAlarm	Default alarm
Reminder	Reminder

Note:
If your theme will use MP3 files, make sure they contain an ID3V2 tag in the beginning of the file. If the ID3V2 tag is missing from the beginning of the file, it will not be possible to pre-listen to the sound. Sound files shouldn't be bigger than 500 Kb. Bigger files can not be pre-listened to.

filename: name of the file to associate with the specified system sound. The sound file can be of any format supported by the media server, and the file name can include a relative path within the theme file.

```
<colors>…</colors>
```
Optional element used to specify some specific text colours that override the colour scheme specified. Only the colour of the text in the standby screen in flip close (FC) can be customized by a theme.

This element has one mandatory attribute:
id: `id="FcStandby"`

```
<textColor>…</ textColor >
```
sub element

When the <colors> element is present it must contain one or more instances of the <textColor> element as sub elements. All attributes for the <textColor> element are mandatory and must be specified:

id: ID to identify the text colour that should use the colour specification.
text: RGB colour value in standard HTML hex format. Specifies the colour to be used on text.
outline: RGB colour value on standard HTML hex format. Specifies the colour to be used on the text outline.

The textColor IDs supported for the "FcStandby" id of the <colors> element are (all lowercase):

- operator
- softkeys
- clock
- alarm
- other

Examples:

```
<textColor id="operator" text="#000000" outline="#9CCE9C"></ textColor>
<textColor id="softkeys" text="#000000" outline="#9CCE9C"></ textColor>
<textColor id="clock" text="#000000" outline="#9CCE9C"></ textColor>
<textColor id="alarm" text="#000000" outline="#9CCE9C"></ textColor>
<textColor id="other" text="#000000" outline="#9CCE9C"></ textColor>
```

Skins and screen saver

Some graphical elements of the theme are not defined in the XML file but just image files added to the zip file.

Those images must have a specific file name, a specific file format and a specific size.

System/ScreenSaver.gif

standard GIF image file (static or animated), if present in the theme package it will be used as screensaver for the device (suggested size: 208x320). The "Screensaver.gif" file must be place in a subfolder of the zip file called "System"

Skins – MBM

A theme package can contain any of the following MBM files with **exactly** the given names:

- AppickerSkin.mbm
- DialogSkin.mbm
- FcTitleBarSkin.mbm
- LauncherSkin.mbm
- ListBoxSkin.mbm
- MenuSkin.mbm
- MenuExtraSkin.mbm
- StatusBarSkin.mbm

Each MBM contains one or more bitmaps with compatible sizes and in the correct predefined order inside the MBM. In the Themes Creator, bitmap files are imported and the MBM files are created and named correctly when the theme is saved.

The bitmaps in the MBM files will be used to draw skins on associated UI control. If the bitmap is smaller than its associated UI control, it will be applied using one of three methods:

- **Normal**: the bitmap is applied to the upper left corner of the control, no stretching or shrinking to match the size of the control is done (the bitmap should already have the correct size).
- **Stretch**: the bitmap will be stretched to match the size of the control (details below).
- **Tile**: the bitmap will be tiled across the control (details below).

Each bitmap **that is stretched or tiled** when applied has a predefined margin associated with it (see image below). When applied, the corner pieces (yellow) are copied as they are to the corners of the control. The side parts (blue) are stretched or tiled (depending on the method used) across the sides of the control, and finally, the centre piece is stretched or tiled across the centre of the control.
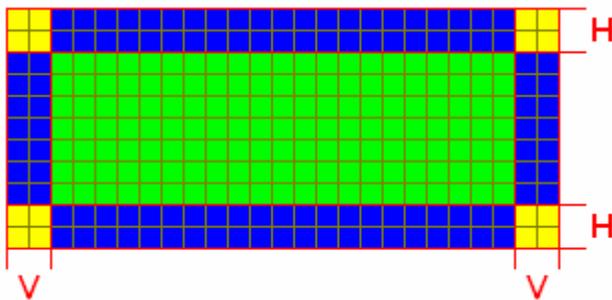
H = horizontal top and bottom margins, in pixels
V = vertical left and right margins, in pixels

Unless sizes of the bitmaps is mentioned below, the exact size doesn't matter much, since the bitmap will be stretched or tiled to fit the control. However, in the case if tiling, the smaller the bitmap is, the more times each piece needs to be tiled, which might affect drawing performance.

Typically, the colour depth of skin bitmaps shall be 12- or 16-bit colour, and the colour depth of masks shall be 1-bit black and white, or 8-bit greyscale for alpha channel.

MenuSkin.mbm

This MBM contains the bitmaps that will be used for the menu bar, and some of the bitmaps for the menu pane.

1 bitmap for menu bar background
1 bitmap for menu title highlight
1 bitmap for menu title highlight mask
1 bitmap for menu item highlight
1 bitmap for menu item highlight activated

 menu bar background:

Draw method: Tile
left & right margins: 6
top & bottom margins: 6
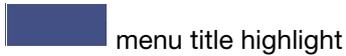
menu title highlight
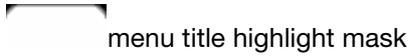
menu title highlight mask

Draw method: Tile
left & right margins: 6
top & bottom margins: 6

Draw method: Tile
left & right margins: 6
top & bottom margins: 6

menu item highlight
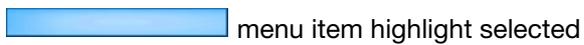
menu item highlight selected

Draw method: Stretch
left & right margins: 1
top & bottom margins: 1

Draw method: Stretch
left & right margins: 1
top & bottom margins: 1

MenuExtraSkin.mbm

1 bitmap for menu pane background
1 bitmap for menu pane separator
1 bitmap with 16 elements for menu item adornments
1 bitmap with 16 elements for menu item adornment masks
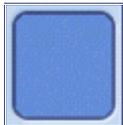
menu pane background

Draw method: Tile
left & right margins: 12
top & bottom margins: 12
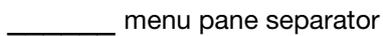
menu pane separator

Draw method: Tile
left & right margins: 4
top & bottom margins: 4

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menu pane adornments

16 elements (2 rows, 8 columns), each one of them 14x14 pixels

Draw method: Normal
left & right margins: 0
top & bottom margins: 0

The elements are (from top left to bottom right):

MenuPaneOptionButtonClear
MenuPaneOptionButtonSet
MenuPaneOptionButtonClearHighlighted
MenuPaneOptionButtonSetHighlighted
MenuPaneOptionButtonClearDimmed
MenuPaneOptionButtonSetDimmed
MenuPaneOptionButtonClearDimmedHigh-
lighted
MenuPaneOptionButtonSetDimmedHighlighted
MenuPaneTick
MenuPaneTickHighlighted
MenuPaneTickDimmed
MenuPaneTickDimmedHighlighted
MenuPaneCascadeArrow
MenuPaneCascadeArrowHighlighted
MenuPaneCascadeArrowDimmed
MenuPaneCascadeArrowDimmedHighlighted

menu pane adornments mask

16 elements (2 rows, 8 columns), each one of them 14x14 pixels

Draw method: Normal
left & right margins: 0
top & bottom margins: 0

DialogSkin.mbm

This MBM contains the bitmaps that will be used for the dialogs:

1 bitmap for un-pressed dialog title
1 bitmap for pressed dialog title

Un-pressed dialog title

Draw method: Stretch
left & right margins: 0
top & bottom margins: 0

Pressed dialog title

Draw method: Stretch
left & right margins: 0
top & bottom margins: 0

ListBoxSkin.mbm

This MBM contains the bitmap that will be used for the listboxes highlight:

1bitmap for listbox highligh

Draw method: Stretch
left & right margins: 20
top & bottom margins: 1

StatusBarSkin.mbm

This MBM contains the bitmap that will be used for the status bar.

1 bitmaps with 2 elements for StatusBar Background (each element 208x18 pixels)

Draw method: Stretch
left & right margins: Stretch
top & bottom margins: Stretch

Note:
Depending on the status bar implementation, the second element used for the background when emphasized might not be used.

FcTitleBarSkin.mbm

This MBM contains the bitmap that will be used for title bar in flip closed mode:

1bitmap for title bar background

Draw method: Stretch
left & right margins: 0
top & bottom margins: 0

AppickerSkin.mbm

1 bitmap for appicker's background
1 bitmap with 6 elements (6 rows, 1 column) for appicker's hoops
1 bitmap with 6 elements (6 rows, 1 column) for appicker's hoop masks
Appicker background (size 208x25 pixels)

Draw method: Normal
left & right margins: 0
top & bottom margins: 0

Appicker Hoops (each 40x25)
Draw method: Normal
top & bottom margins: 0
left & right margins: 0
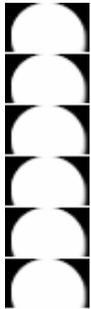
Appicker Hoops mask (each 40x25)
Draw method: Normal
top & bottom margins: 0
left & right margins: 0

LauncherSkin.mbm

This MBM contains the bitmap that will be used for the AppLauncher

1 bitmap with 5 elements (5 rows, 1 column) for AppLauncher disks & disks animation
(from 30x30 to 44x44)
1 bitmap with 5 elements (5 rows, 1 column) for mask to the disks (from 30x30 to 44x44)

Draw method: Normal
left & right margins: 0
top & bottom margins: 0

Draw method: Normal
left & right margins: 0
top & bottom margins: 0

Standby PNG files

The following files will be used in Flip Close telephony standby screen. They must placed in a subfolder of the zip file called "Standby" (for example "Standby/ ShortCutUnselectedBall.png)

ShortCutUnselectedBall.png

  42x42 pixels

ShortCutSelectedBall.png

  42x42 pixels

ShortCutBallHalo.png

 42x42 pixels

Example of a valid XML file

```xml
<?xml version="1.0"?>

<!DOCTYPE theme SYSTEM "theme.dtd">

<theme title="Theme_example" author="John Doe "

copyright="UIQ Technology AB (C) 2003"
      screenWidth="208" screenHeight="320">

      <wallpaper id="Launcher">wp_launch.jpg</wallpaper>
      <wallpaper id="FcStandby_208x189">wp_standby.jpg</wallpaper>

      <condensedColorScheme>
            <darkColor background="#316331" text="#FFFFFF"></darkColor>
            <midColor background="#9CCE9C" text="#000000"></midColor>
            <lightColor background="#D5EAD5" text="#000000"></lightColor>
      </condensedColorScheme>

      <systemSound id="DefaultRing">ring.wav</systemSound>
      <systemSound id="MessageNewSms">new_sms.wav</systemSound>
      <systemSound id="MessageNewMms">new_mms.wav</systemSound>
      <systemSound id="MessageNewEmail">email.wav</systemSound>
      <systemSound id="MessageNewEmail">email.wav</systemSound>

      <colors id="FcStandby">
            <textColor id="operator" text="#000000" outline="#9CCE9C"/>
            <textColor id="softkeys" text="#000000" outline="#9CCE9C"/>
            <textColor id="clock" text="#000000" outline="#9CCE9C"/>
            <textColor id="alarm" text="#000000" outline="#9CCE9C"/>
            <textColor id="other" text="#000000" outline="#9CCE9C"/>
      </colors>
</theme>
```

P900/P910 theme creation

In this section we're going to illustrate some practical issues in P900/P910 themes creation.

Colour scheme

A theme xml must contain the definition of a colour scheme. It's often tricky to find a good combination of colours that is readable and nice.

For instance, the following ColorScheme:

```
<condensedColorScheme>
<darkColor background="#B2C1D3" text="#000000"></darkColor>
<midColor background="#3B74B9" text="#FFFFFF"></midColor>
<lightColor background="#FFFFFF" text="#000000"></lightColor>
</condensedColorScheme>
```

can be graphically visualized with the following image:
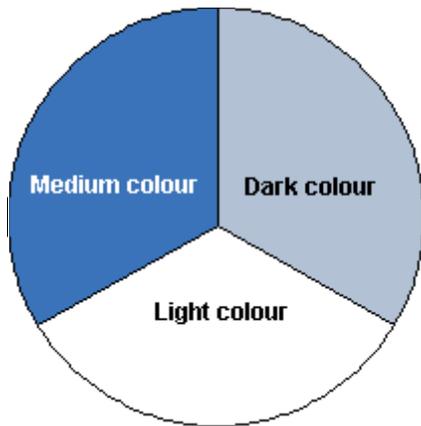
Where each sector's background colour corresponds to a background colour in the xml, and the text written into each sector uses the colour defined by text in the same xml tag.

In Applauncher, to improve readability when a bitmap is used to highlight items, the text colour will be dark with a light outline if the current colour scheme's highlight text colour is dark, and light with a dark outline if the current colour scheme's highlight text colour is light.

Wallpaper

- A theme may contain wallpaper for Flip Open (FO), Flip Close (FC) , or both. The suggestion is to use **JPEG** files for the images to limit the size of the final package.
- If an **animated GIF** is used, the first frame will be used as image for the wallpaper.
- Optimal size for Flip Close wallpaper is 208x190, and 208x256 for Flip Open wallpaper.
- If an image is too wide for the container area, the image will be cropped from the right.
- If an image is too high, the bottom part will be cropped.
- If a theme package does not contain any wallpaper, no image will be displayed and the light colour from the colour scheme will be used instead.

Fixed elements

Bitmaps and colour scheme

It's important to find a good combination between the colours of the graphical elements (MBM) and the colour scheme. For example when an element is highlighted in a list box it will use the bitmap provided by listboxskin.mbm but the text colour will be taken from the colour scheme.

The same can be applied to most of all other graphical elements. A trade-off must be done between readability and bitmap colours.

Bitmap size and borders

In the previous chapter we saw that some bitmaps will use pre-defined borders when drawn on the screen, the size of those bitmaps cannot be smaller than the sum of their borders.

Bitmap size and drawing performance

Some of the fixed graphical elements are scaled or tiled when drawn to the screen. The closer the size of a bitmap is to the size of the area where it is displayed, the faster it will be drawn. Larger bitmaps lead to a bigger theme package. MBM files does not seem to have so much impact on the theme size as sound files and wallpaper images.

For some elements the size on screen never changes. If their bitmap has the same size as the final drawing area, performance will be optimal. Some on-screen sizes:

- DialogSkin.mbm bitmaps: 208x25
- Menu bar background bitmap (menuskin.mbm): 208x21
- FcTitleBarSkin.mbm bitmap: 208x23

The optimal size for elements like bitmap in listboxskin.mbm, menu pane background (in menuextra.mbm), and all the bitmaps other than menu bar background in menuskin.mbm is much more complex to define. These bitmaps are used for elements with largely variable size and only a good balanced trade-off can give the best results.

A simple suggestion is not to make those bitmaps too small, especially the ones that will be tiled (the more times a bitmap must be tiled, the slower it will be).

Launcherskin.mbm

There is no fixed size for the bitmaps in this MBM, but every element of each bitmap must have the same size. The shape of the elements must not necessarily be a square.

If the size of the bitmap is too wide or too high, it will not be used. For example, if the bitmap for the disk icons is larger than 44 pixels, the default bitmap will be used instead.

If LauncherSkin.mbm is not included in the theme package, the default bitmap will be used, and its colours will be remapped to the colour scheme.

Example:

With a "green" scheme

With a "blue" scheme

AppickerSkin.mbm

All the bitmaps of this MBM have a fixed size.

If this MBM is missing in the theme package, the default bitmap is used and its colours are remapped to the colour scheme.

StatusBarSkin.mbm

The bitmap has a fixed size.

If this MBM is missing in the theme package, the default bitmap is used, and its colours are remapped to the colour scheme.

Bitmap masks

Many of the bitmaps require masks.

A bitmap mask for an MBM file is a standard BMP file where white (#FFFFFF) identifies 100% opacity and black 0% opacity (fully transparent). All shades of grey between white and black identify different levels of opacity (alpha blending).

To be sure that the resulting mask in the final MBM give the expected result, we suggest converting the original mask-bitmap to an 8bit grey-scale bitmap.

System Sounds FAQ

Q: What happens in the xml contained by a theme if I define a system sound that is not in the list (for example MessageNewBeamedObject) ?
A: Nothing, the line will be ignored, both by the system and the UI.

Q: Every time I create a theme, must I define all system sounds in the given order?
A: No, you can define any of the sounds in any order that suits you best

Q: Does the order I define my sounds in xml influence their order in the UI?
A: No, the order in the UI is always the same.

Q: What happens if I don't set a specific system sound (for example MessageNewSms)?
A: It will not appear in the UI, it will not be set, and its major sound (default message in this example) will be used instead.

Q: Are XML tag attributes case sensitive?
A: Yes