TELIUM – ImageLoader User's Guide

ICO-AMA-003-IN-EN-V2

Group Applications Management Department

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Document Change History

Version / Revision	Date	Changes description	Author	Visa
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1.0	May 31, 2010	Completion and English translation	Jean-Luc FRIMOUR	
1.1	October 08, 2010	Add ImageLoader 1.5 New features	Sodki JARRAYA	
1.2	November 09, 2010	Add some explanation	Hatem MASMOUDI	
1.3	March 1rst, 2011	New supported terminals added	Jean-Luc FRIMOUR	

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1. Introduction

IMAGELOADER is an application managing IDLE SCREEN dedicated to TELIUM colour terminals.

Thanks to its menus, the user can select an image or a series of images (animation) that will be displayed during terminal "Idle State". Images could be preloaded in terminals flash memory files system or thanks to an USB key or an SD card, be introduced and be stored in terminal memory. Any action on the keyboard stops this displaying and let the terminal to perform its normal payment operations. User can define his idle screen from µSD card without copying it into TERMINAL.

1.1 Supported terminals

TELIUM 1 architecture based : PCIPED v1.3	
EFT930C (color, C'less) 	Display characteristics: • 4096 colors (4x4x4bits) • 320x240 pixels, • 2.3 inch • Screen access: less than 10 screens full refresh per second = Video through animations.
ML30 (color, C'less) 	Display characteristics: • 4096 colors (4x4x4bits) • 320x240 pixels, • 2.3 inch • Screen access: less than 10 screens full refresh per second = Video through animations.
TELIUM 2 architecture based : PCIPED v2.0	
ICT250 	Display characteristics: • 4096 colors (4x4x4bits) • 320x240 pixels, • 2.5 inch • Screen access: less than 15 screens full refresh per second = Video through animations.
IPP350 	Display characteristics: • 4096 colors (4x4x4bits) • 320x240 pixels, • 2.5 inch • Screen access: less than 15 screens full refresh per second = Video through animations.

IWL250 	Display characteristics: • 4096 colors (4x4x4bits) • 320x240 pixels, • 2.5 inch • Screen access: less than 15 screens full refresh per second = Video through animations.
TELIUM 2 multimedia based : PCIPED v2.0	
ISC250 	Display characteristics: • 16Mk colors (8x8x8bits) • 480x272 pixels (WIDE QVGA) • 4.3 inch • Screen access: > 50 screens full refresh per second = Video capabilities.
ISC350 	Display characteristics: • 256k colors (6x6x6bits) • 640x480 pixels • 5.7 inch • Screen access: > 50 screens full refresh per second = Video capabilities.

Table 1 : Supported TELIUM Colour Terminals

Note: *Currently the behaviour of ImageLoader has not been qualified on IWL250 mass prod machines.*

1.2 Mass Storage constraints

- USB key must have identical FATs to be recognized by TELIUM terminal (backup FAT must be equal to main FAT)
- MicroSD must have partition to be recognized.

1.3 Terminal software constraints

- ImageLoader application needs software TELIUM PLATFORM (SDK) minimum version installed: 7.4
- ISO1 font must be loaded with the application to support "French" language.
- Chosen TELIUM MANAGER can be "CGUI" ready or not.
- Some extra DLLs must be loaded to support some specific image formats (BMP, JPEG and PNG).
- TELIUM MANGER "SCREEN.INI" feature must not be activated for "IDLE_COLOR" parameter.
- Other applications present in terminal must not used mechanisms that could interfere with ImageLoader like managing a concurrent Idle Screen thanks to IDLE_MESSAGE event.

1.4 Supported image format

The current supported image formats are:

- « BMP » = bitmap images.

- « JPEG » (Joint Photographic Experts Group) = ISO/IEC IS 10918-1 | ITU-T Recommendation T.81 image format
- « PNG » (Portable Network Graphics) = ISO/CEI 15948:2004 image format.

1.5 Selected images constraints

- Selected images size must never exceed the screen size.
- According to memory needed to build up JPEG images, their size must never exceed 80 Kbytes. ImageLoader prevent against loading greater JPEG images.
- To not interfere with terminal performances , images must be sized to screen characteristics (320x240 pixels or other)
- In same way, the colour depth must not exceed 24 bits
- For non multimedia terminal, images must be reworked to remove scaling effect due to 4096 colours palette limitation.

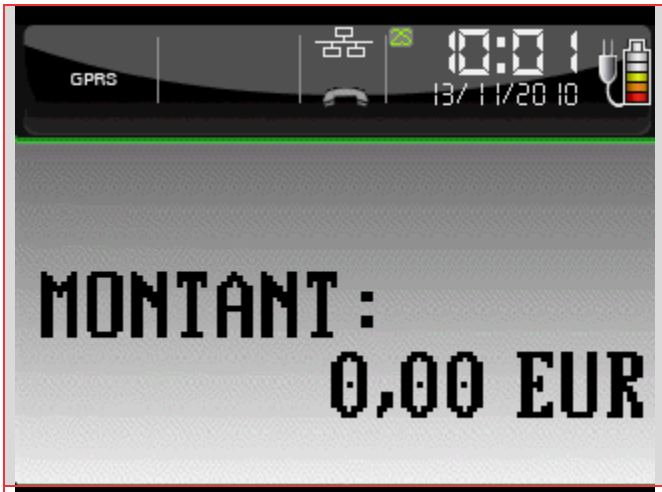
Note:
To summarise, to obtain the best in term of performance, privileged reworking on images before loading them, even if some capacities of adaptation exist inside the terminal.

To resize images, INGENICO dedicate tools to do so: Pictures Optimizer

2. ImageLoader application menus description

2.1 ImageLoader main menu

This table illustrates the main ImageLoader menu and the way to process.

	**During terminal IDLE state (Amount message or specific IDLE Screen present), action on « F » (=Menu) key causes terminal entering in « Menus selection » step.**
	Highlighted text can be moved thanks to: • "F2" to go down • "F3" to go up • "F4" to go end
	When "ImageLoader" text is highlighted, "GREEN" key hitting causes corresponding application menu selection.

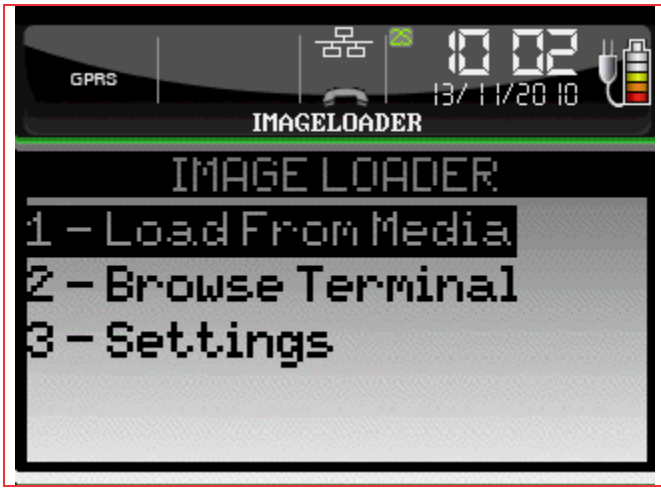
	ImageLoader offers 3 menus: • "Load From Media" menu: To display images and Animation stored on USB key and Micro SD card. • "Browse terminal" menu: To display images and animations stored on the terminal memory (full description is given in IDLE Screen configuration paragraph). • "Settings" menu: To set and modify the application parameters.

Table 2 : ImageLoader main Menu description

2.2 "Load From Media" menu

This table illustrates the "Load From Media" menu and the way to process.

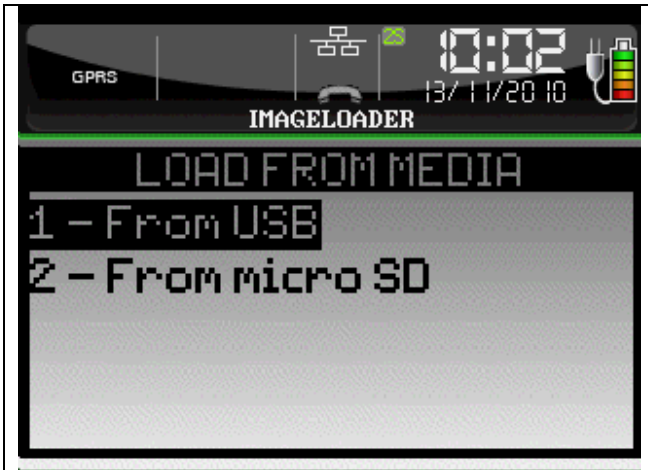
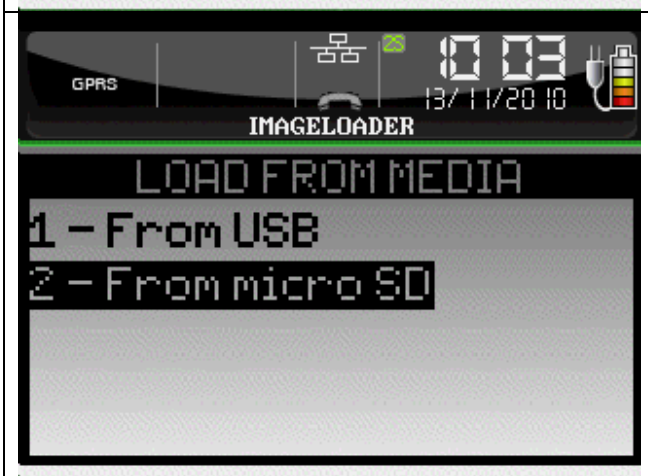
	"From USB" menu: Allow displaying images and animations stored on USB key (full description is given in IDLE Screen configuration paragraph).
	"From uSD" menu: Allow displaying images and animations stored on µSD card (full description is given in IDLE Screen configuration paragraph).

Table 3 : "Load From Media" Menu description

2.3 "Settings" menu

This table illustrates the "Settings" menu and the way to process.

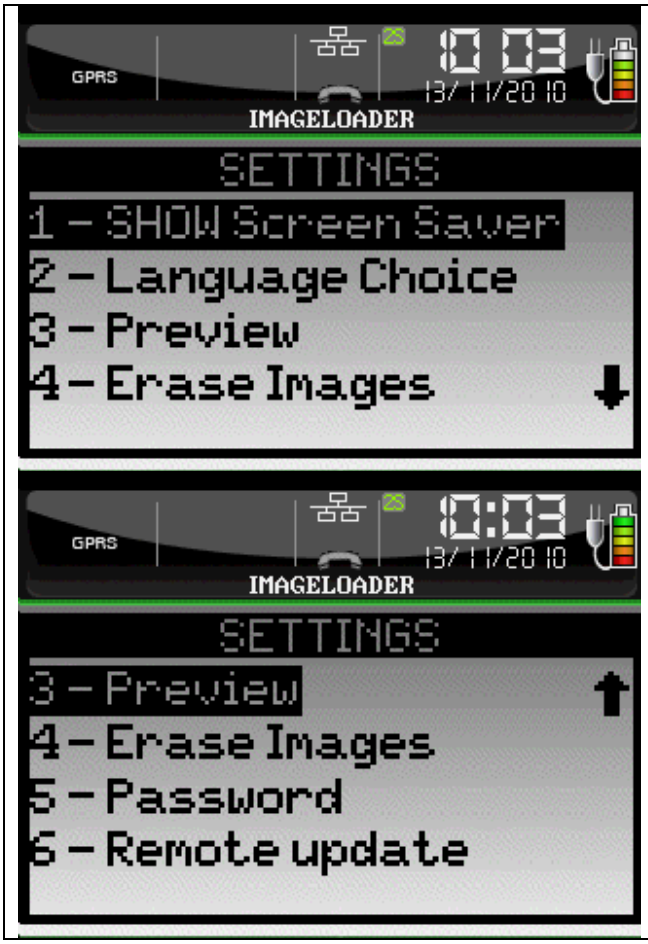
	The "Settings" menu contains six items: • "Hide/Show Screen Saver" submenu • "Language choice" submenu • "Preview" submenu • "Erase Images" submenu • "Password" submenu • "Remote Update" submenu

Table 4 : "Settings" Menu description

2.3.1 "Hide/Show Screen Saver" menu

The "GREEN" key hitting on this menu changes the default state of ImageLoader Idle screen:

- Enable
- Disable

This operation does not affect the selection and the images storing previously done on the terminal, but just suspends IDLE screen rendering.

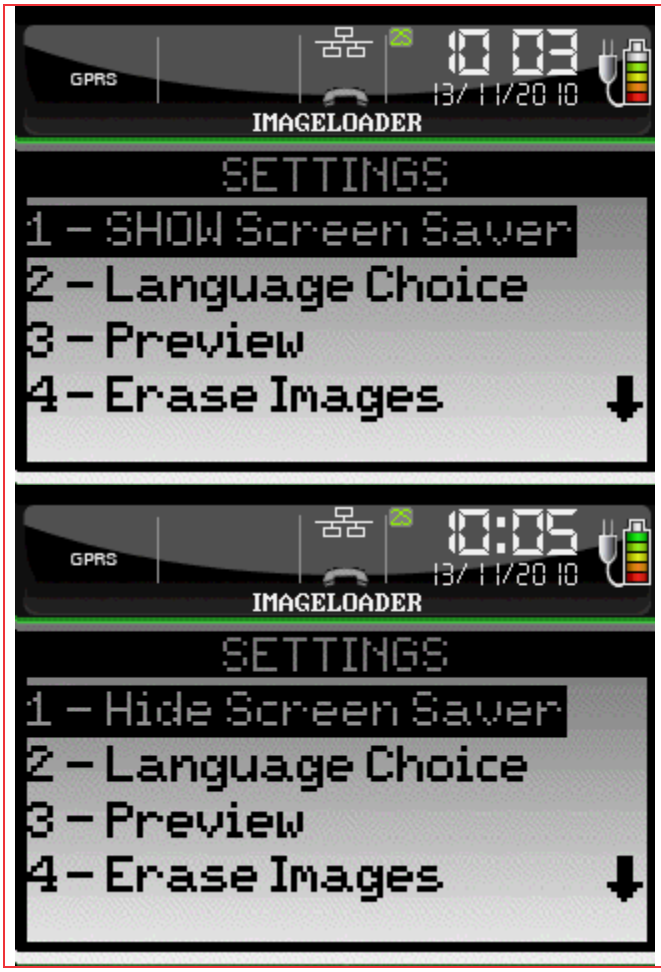
	In trying to change the state of a not configured ImageLoader application, the following message is displayed: IMAGELOADER : application Name User "GREEN" key action is expected to exit.

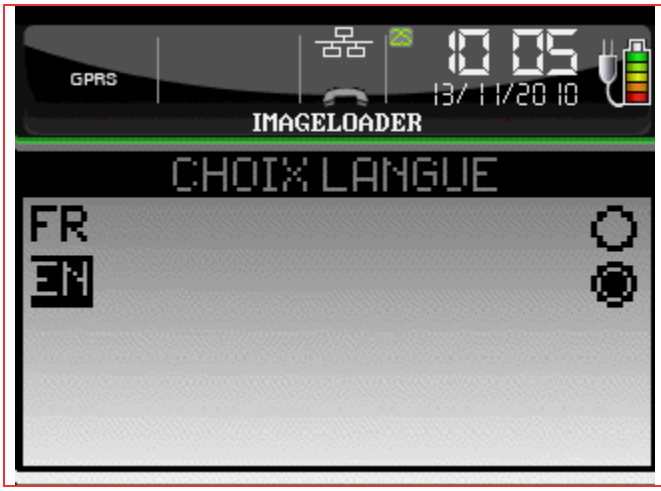
Table 5 : "Hide/Show Sceen Saver"

2.3.2 "Language choice" menu

By default, only two languages are currently supported:

- French (initial default)
- English

The following table illustrates the ImageLoader "Language choice" menu and the way to process.

	According to the previous language setting different screens are displayed Radio button can be selected thanks to: "F2" to go down "F3" to go up

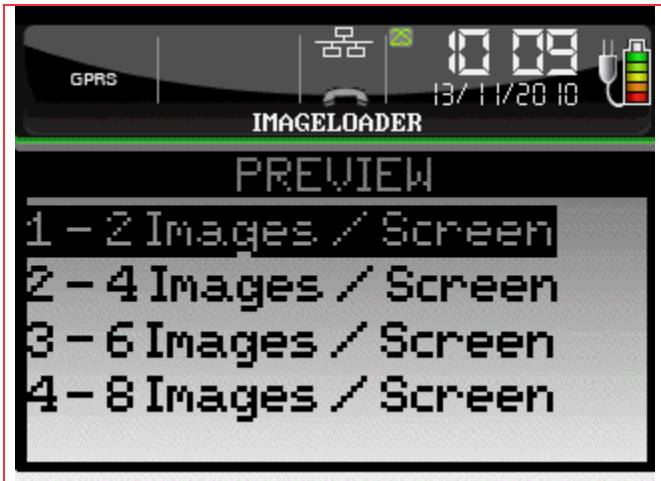
	When the wanted language is selected, "GREEN" key hitting causes selection registering. This parameter will be used now during ImageLoader execution.

Table 6 : "Language" menu description

Other languages can be supported through Telium Manager "MESSAGE" mechanism. This implies programming and loading of resulting optional text messages in the terminal.

2.3.3 "Preview" menu

This table illustrates the ImageLoader "Preview" menu and the way to process.

	Four pictures/screen combinations are proposed to the user. Highlighted text can be moved thanks to: • "F2" to go down • "F3" to go up • "F4" to go end When one combination is highlighted, "GREEN" key hitting causes selection registering. This parameter will be used now during "IDLE Screen configuration" process.
	During "IDLE Screen configuration" process images can be displayed 2 by screen.

	During "IDLE Screen configuration" process images can be displayed 4 by screen.
	During "IDLE Screen configuration" process images can be displayed 6 by screen.
	During "IDLE Screen configuration" process images can be displayed 8 by screen.

Table 7 : "Preview" menu description

2.3.4 "Erase Images" menu

This table illustrates the ImageLoader "Erase Images" menu and the way to process.

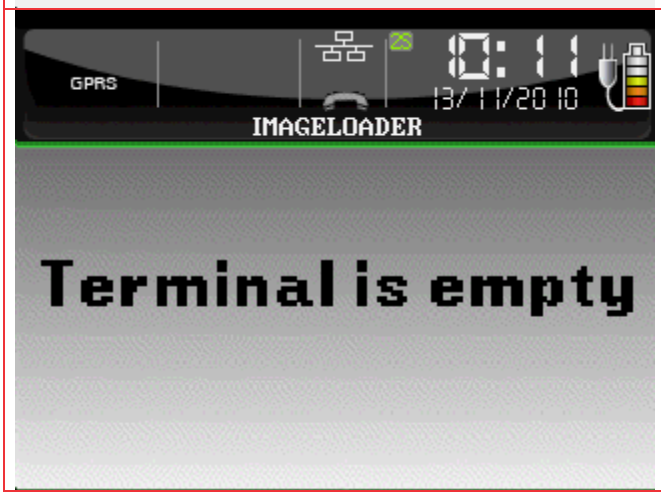
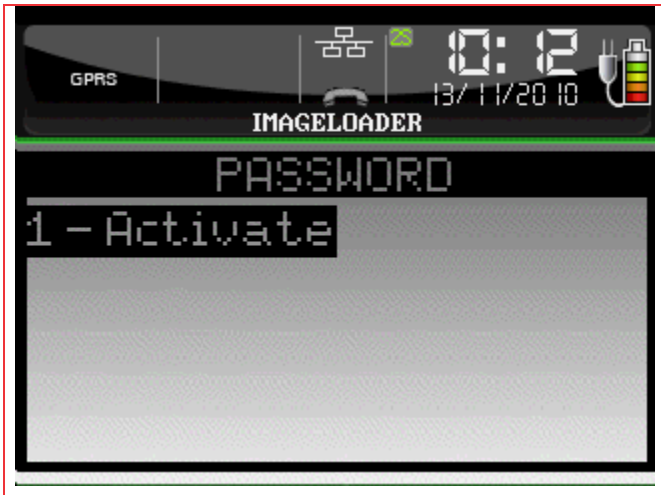
	**Thanks to "GREEN" key, the user can erase all images and animation stored in terminal.** **"RED" key hitting returns to previous screen (Menus selection).**
	The terminal displays during a short time a message to confirm the full erasing of "images" previously stored in terminal.

Table 8 : "Erase Images" menu description

2.3.5 "Password" menu

The access to the main menu of the ImageLoader application can be protected by a password.
This table illustrates the ImageLoader "Password" menu and the way to process.

	"Activate": Hitting this sub menu causes the application protection to be activated. The ImageLoader main menu is protected and **a** password must be given **to allow** access **to** the **ImageLoader** main menu.

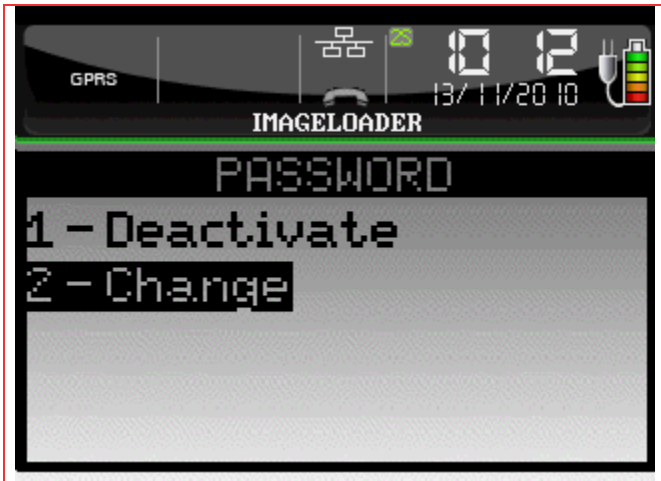
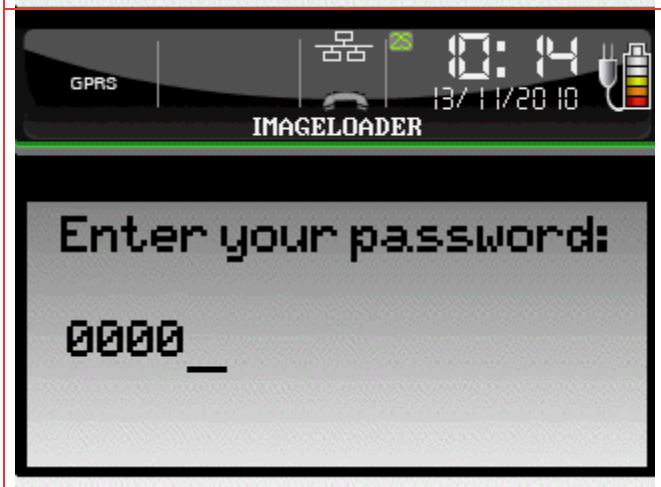
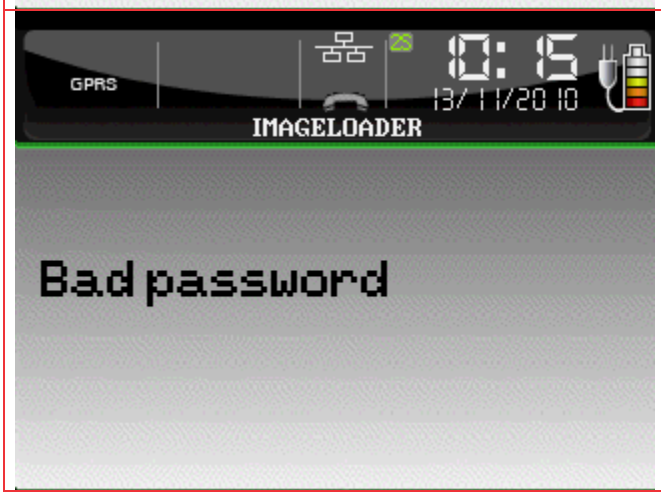
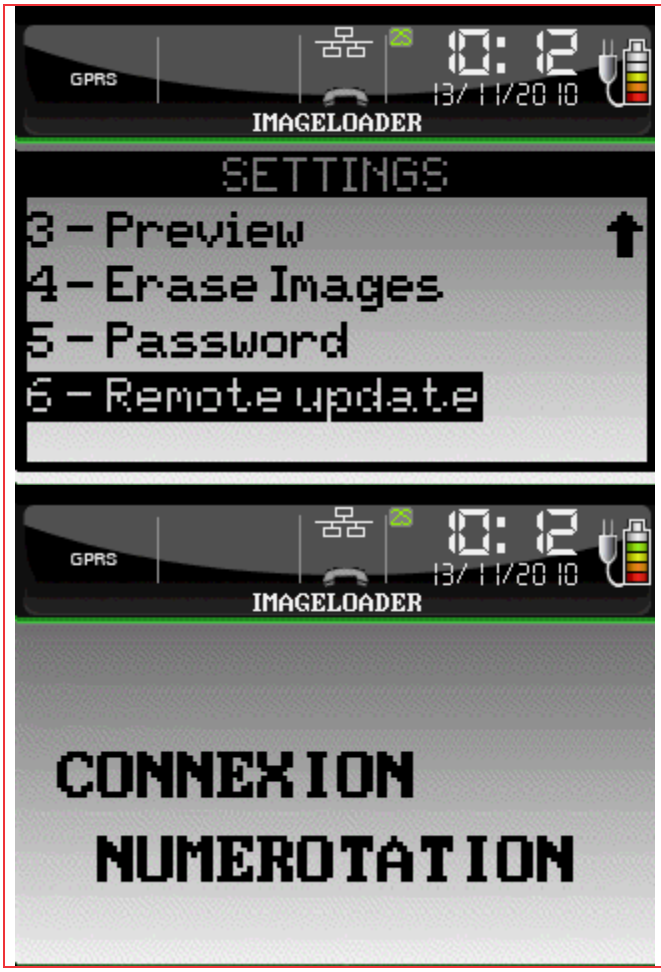
	"Desactivate": Hitting this sub menu causes the application protection to be disabled. The ImageLoader main menu is not protected by password. "Change": This menu allows user to **change the password used to protect the access to the application main menu.** This menu is available only if a password protection is enabled**.**
	This Screen is prompted when application is protected by Password. User has to enter a valid password to have access to application Menu.
	This Screen is displayed if user enters a wrong password.

Table9 : "Password" menu description

2.3.6 "Remote Update" menu

This table illustrates the ImageLoader "Remote Update" menu and the way to process.



Using this menu, the user can download remotely images and animations stored on a TMS server.
After the download is completed, the animations and images are stored on the terminal memory and the user can display this files throw the "Browse Terminal" menu.

Table 10 : "Remote update" menu description

2.4 IDLE Screen configuration

Four different actions can lead to this menu:

- "USB key" menu selection
- "SD memory card" menu selection
- "Terminal" menu selection
- ImageLoader is notified that an USB key is inserted in terminal

This menu proposes to user new images or animations storage/deleting and IDLE screen configuring.

According to hardware support where images can be found (USB Key, SD memory card or terminal flash memory files system), a brief message is displayed to indicate reading in progress.

- ***"Reading USB Key..."***
- ***...***

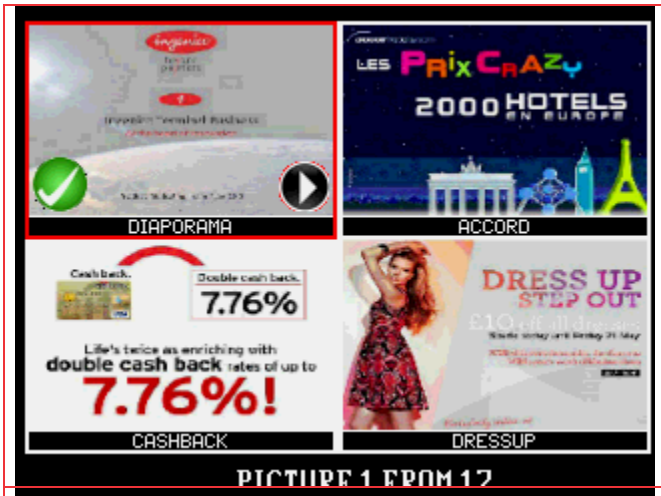
If ImageLoader does not find images or animations, the following message is displayed briefly.

- ***"No File Found!!"***

If ImageLoader find images or animations, it displays them as thumbnails by 2 or 4 or 6 or 8 (according to application configuration = see "Settings menu" paragraph).

The following tables illustrate the "IDLE Screen configuration" process for images and animations.

2.4.1 IDLE screen image selection



The first image is bordered with a red rectangle.

Thanks to "F1" and "F4" keys, the user can put the focus to previous or next image.

Usage of "RED" key aborts IDLE screen selection, the terminal returns to IDLE state. (Previous selected IDLE Screen or "AMOUNT" message.)

Thanks to "GREEN" key, the user can select an image or an animation.

So, the selected image is displayed in full screen mode as it will be rendered in IDLE Screen mode.

Thanks to "GREEN" key, the user can access to IDLE screen image registering.

"RED" key hitting returns to previous screen (images and animations selection).

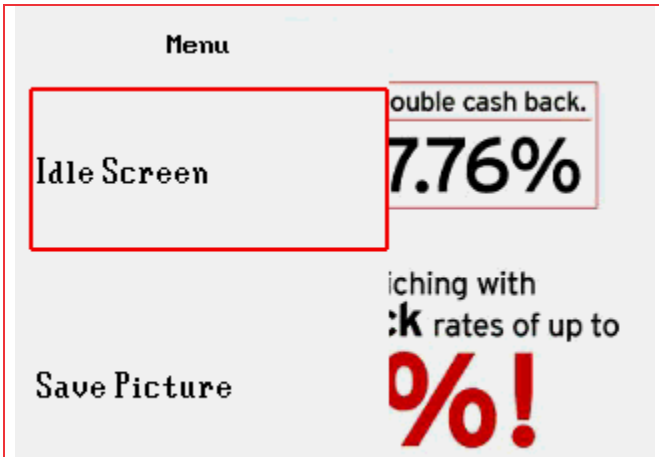
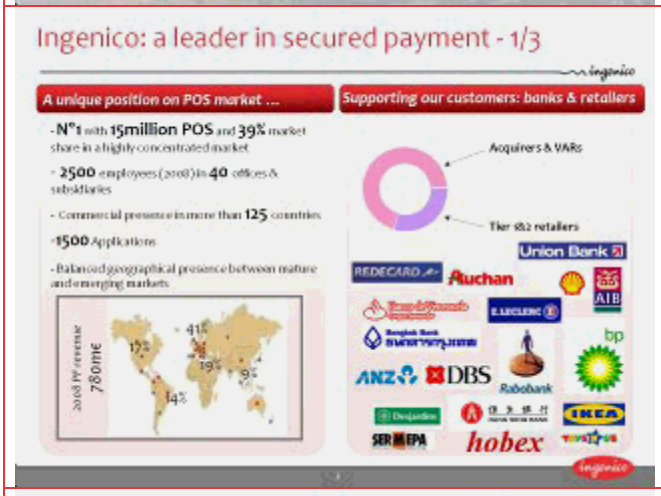
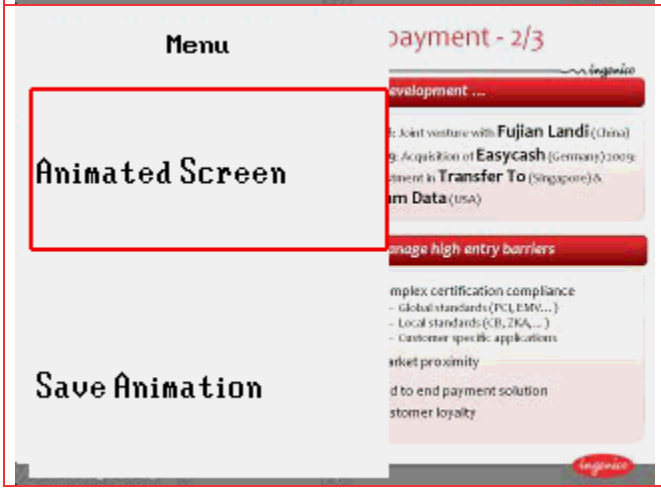
	Thanks to "GREEN" key, the user can register the image as IDLE screen in terminal memory.
Saved as Idle Screen	After having displayed briefly 'Please wait…", the following screen is displayed. If the image does not exist in the terminal disk, the image is copied to the terminal. The previous IDLE screen settings are overridden (The idle screen mode is activated and the new image is displayed when idle screen is on). Two hitting of "RED" key cause IDLE screen selection exit. The terminal returns to IDLE state. (New selected IDLE Screen on)

Table 11 : Idle screen image configuration description

2.4.2 IDLE screen animation selection

	**If an "Animation" is found the first image is stamped with the classical "PLAY" icon.** **Thanks to "GREEN" key, the user can select the animation.**

	So, the selected animation is displayed in full screen mode as it will be rendered in IDLE Screen mode. …
	… Thanks to “GREEN” key, the user can access to IDLE screen animation registering. “RED” key hitting returns to previous screen (images and animations selection).
	Thanks to “F2” and “F3” keys, the user can put the focus on “Animated Screen” line. Thanks to “GREEN” key, the user can register the animation as Animated Screen in terminal memory.

Saved as Animated Screen	After having briefly displayed 'Please wait…", the following screen is displayed. If the animation does not exist in the terminal disk, the animation directory (animation images and parameters file) is copied to the terminal. The previous IDLE screen settings are overridden (The idle screen mode is activated and the new animation is displayed when idle screen is on). Two hitting of "RED" key cause IDLE screen selection exit, the terminal returns to IDLE state. (New animated IDLE Screen on)

Table 12: IDLE screen animation configuration description

2.5 Image And Animation storing

Three different actions can lead to this menu:

- "USB key" menu selection
- "SD memory card" menu selection
- ImageLoader is notified that an USB key is inserted in terminal

The following tables illustrate the "Store" process for images and animations.

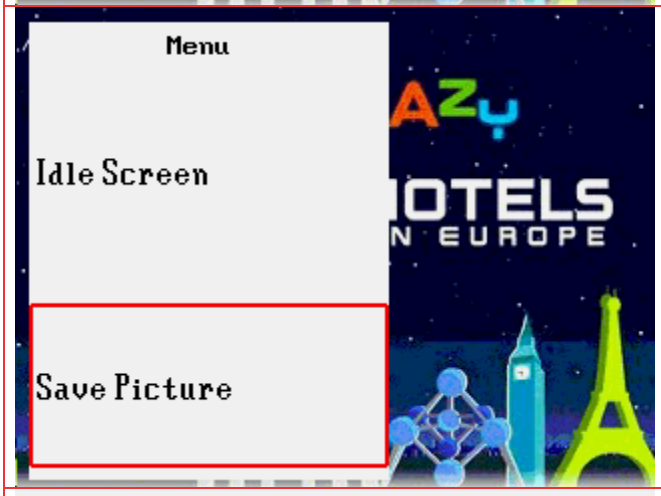
2.5.1 Image storing

	**To store one image, same key actions are done as in previous paragraphs.**

So, the selected image is displayed in full screen mode as it will be rendered in IDLE Screen mode.

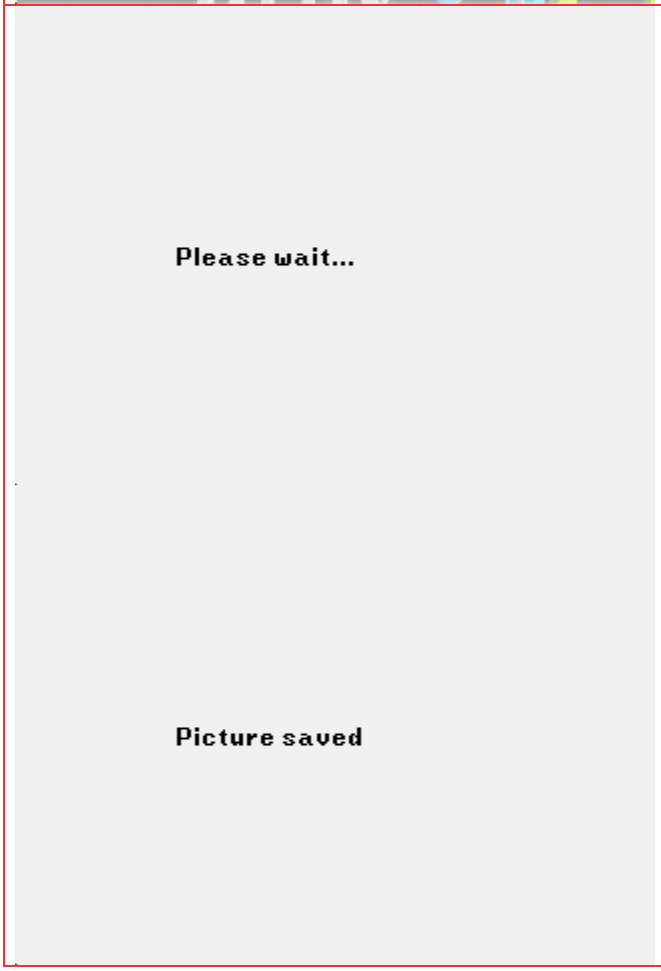
Thanks to "GREEN" key, the user can access to image registering.

"RED" key hitting returns to previous screen (images and animations selection).



Thanks to "F2" and "F3" keys, the user can put the focus on "Save Picture" line.

Thanks to "GREEN" key, the user can register the image in the terminal memory.



The terminal displays briefly a message to confirm the storage in terminal and returns to images and animations selection screen.

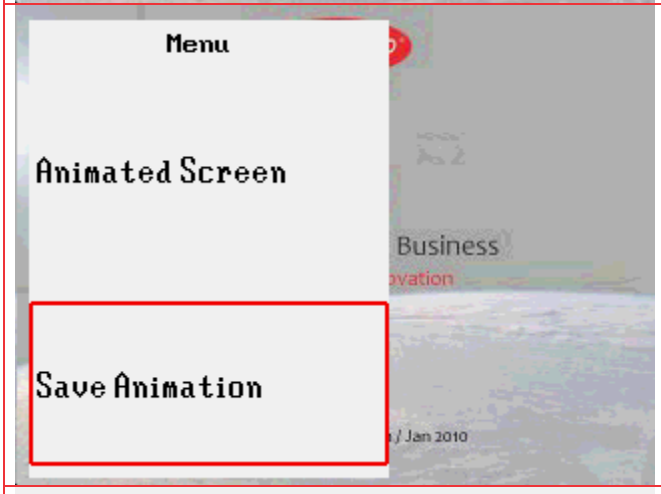
Please wait... Picture already Exists	If the image is already present, the present warning is displayed during a short time. The terminal returns to images and animations selection screen.

Table 13 : Image storing description

Note: *When the memory is full, ImageLoader does not store the image and warns the user with a specific message.*

2.5.2 Animation storing

	**To store one animation same key actions are done as in previous paragraphs.**

	So, the selected animation is displayed in full screen mode as it will be rendered in IDLE Screen mode. Thanks to "GREEN" key, the user can access to Image registering. "RED" key hitting returns to previous screen (images and animations selection).
	Thanks to "F2" and "F3" keys, the user can put the focus on "Save Animation" line. Thanks to "GREEN" key, the user can register the animation in terminal memory.
	The terminal displays briefly a message to confirm the storage in terminal and returns to images and animations selection screen.

	If the animation is already present, the present warning is displayed during a short time. The terminal returns to images and animations selection screen.

Table 14 : Animation storing description

Note: *When the memory is full, ImageLoader does not store the animation and warns the user with a specific message.*

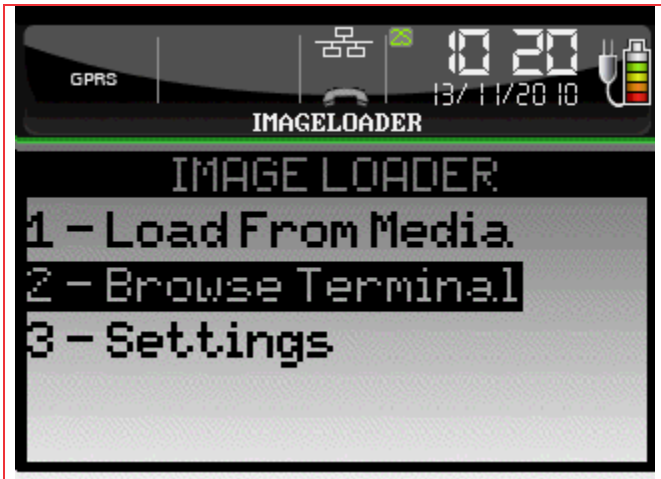
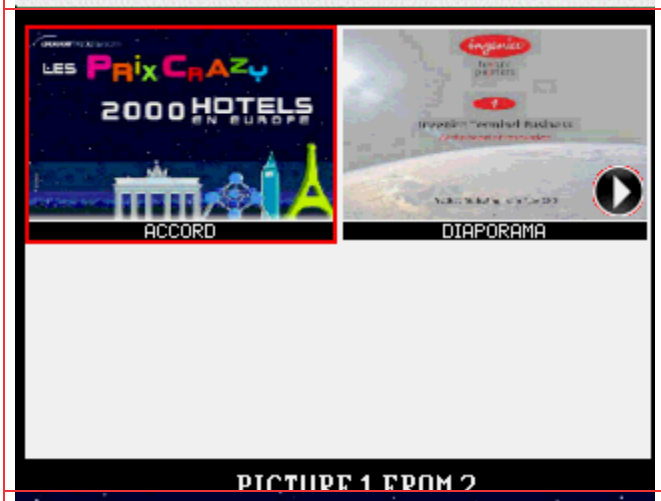
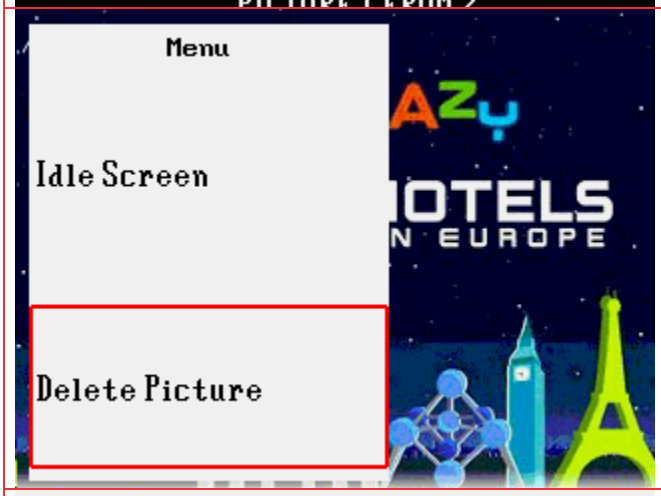
2.6 Image And Animation deletion

Three different actions can lead to this menu:

- "USB key" menu selection
- "SD memory card" menu selection
- "Terminal" menu selection
- ImageLoader is notified that an USB key is inserted in terminal

The following tables illustrate the "Delete" process for images and animations.

2.6.1 Image deletion

	**To delete one image in selected hardware support only from terminal, same key actions are done as in previous paragraphs.**
	So, the selected image is displayed in full screen mode as it will be rendered in IDLE Screen mode. Thanks to "GREEN" key, the user can access to image deleting. "RED" key hitting returns to previous screen (images and animations selection).
	Thanks to "F2" and "F3" keys, the user can put the focus on "Delete Picture" line. Thanks to "GREEN" key, the user can start deleting the image.
	Thanks to "GREEN" key, the user can erase the selected image stored in the terminal, the USB key or the SD card. "RED" key hitting returns to previous screen (Image Display).

Please wait... Picture deleted...	The image deletion is confirmed by a short warning message and the application returns to the images and animations selection screen.

Table 15 : Image deletion description

Remark:

When using "Terminal" menu (image reading in terminal memory), the current selected IDLE screen (Image or Animation) is stamped as in the following screenshot.

2.6.2 Animation deletion

<table>
<tr>
<td> 
</td>
<td>To delete one animation from only TERMINAL, same key actions are done as in previous paragraphs.</td>
</tr>
<tr>
<td> 
</td>
<td>So, the selected animation is displayed in full screen mode as it will be rendered in IDLE Screen mode.

Thanks to “GREEN” key, the user can access to animation deleting.

“RED” key hitting returns to previous screen (images and animations selection).</td>
</tr>
<tr>
<td> 
</td>
<td>Thanks to “F2” and “F3” keys, the user can put the focus on “Delete Animation” line.

Thanks to “GREEN” key, the user can start deleting the animation.</td>
</tr>
<tr>
<td> 
</td>
<td>Thanks to “GREEN” key, the user can erase the selected animation stored in the terminal, the USB key or the SD card.

“RED” key hitting returns to previous screen (Animation Display).</td>
</tr>
</table>

	The animation deletion is confirmed by a short warning message and the application returns to the images and animations selection screen.

Table 16 : Animation deletion description

3. Application running description

3.1 Application start-up

During start-up, ImageLoader application performed two tests:

- "Is the ImageLoader configured?"
- "Are all required rendering DLL present in terminal?"

When the application is not configured, the following message is displayed briefly.

- ***"No File Found!!"***

When required rendering DLL are missing, one of the following messages is displayed briefly according to the found error.

- ***"No Image Will Be Displayed DLL Not Found"***
- ***"JPG Images Will Not Be Displayed DLL Not Found"***
- ***"PNG Images Will Not Be Displayed DLL Not Found"***

After this control step, if an animation sequence or an image is stored, ImageLoader initializes its idle screen mechanism and displays a first image. In the reverse case, ImageLoader does nothing.

3.2 USB key insertion

ImageLoader when running responds to USB key insertion: it proposes to user new images or animations storing and configuring.

When an USB key is inserted, a brief message is displayed to indicate reading in progress.

- ***"Reading USB Key..."***

If ImageLoader does not find images or animations, the following message is displayed briefly.

- ***"No File Found!!"***

If USB key is removed during IDLE screen configuration, two possibilities:

- The terminal does not give a warning; just leave blank the image areas.
- The terminal displays briefly ***"USB Key Removed".***

When images or Animation directory are found, ImageLoader processes as described in IDLE Screen configuration paragraph.

4. How to prepare "IMAGES" and "ANIMATION"

4.1 How to prepare animations

An ***Animation*** is a series of images stored in a directory. The animation parameters are defined in "Anim.IL" file which is stored in the animation directory.
The animation parameters are:

1- The iamges speed: A parameter that defines the duration of display of one or a list of images.
2- The animation images: A list of images names defined in the display order, and stored in the animation directory.

To make an animation, following steps should be done:
1- Create a directory having the animation name.
2- Copy all animation images to the animation directory.
3- Create a file named "Anim.IL" in the animation directory.
3- Edit the "Anim.IL" file:
- Put the animation name in the first line of "Anim.IL" file.
- Put the images speed in previous line of images on "Anim.IL" file.
- Put images names list in the same order of the animation display. Each image name must be in a separate line, starting from third line.

Duration is defined using float number:
= 0: means no delay between images painting.
= 0,5: means ½ second
= 1,5: means 1 second and a half

Note:

1- Animation images must be prepared as described in the "4.2" paragraph.
2- If any of the following parameters are wrong, Terminal will show "`Operation not possible`":
   - Image Name is not valid
   - The Anim.IL file is not respecting the provided format.
3- Duration parameter must not exceed 60 seconds. The Terminal will show in this case only one image per animation.
4- One animation must not have more than 200 images. In this cases animation will load only the 200 first images
5- The maximum of images/animation supported by the terminal is 500.

Example: *Content of "Anim.IL" for JRP animation*

```
JRP
duration=1,5
01.bmp
02.bmp
03.bmp
duration=0
04.bmp
05.bmp
duration=0,5
06.bmp
```

4.2 How to prepare images

Images must be treated according to terminals specificities (see "Introduction" paragraph – "Images constraints"). For non multimedia terminals (most part of INGENICO EFTs range), images must be reworked to remove scaling effect due to colour palette limitation to 4096 colours.

4.2.1 Dithering

Dithering is a technique used in computer graphics to create the illusion of colour depth in images with a limited colour palette (colour quantization)

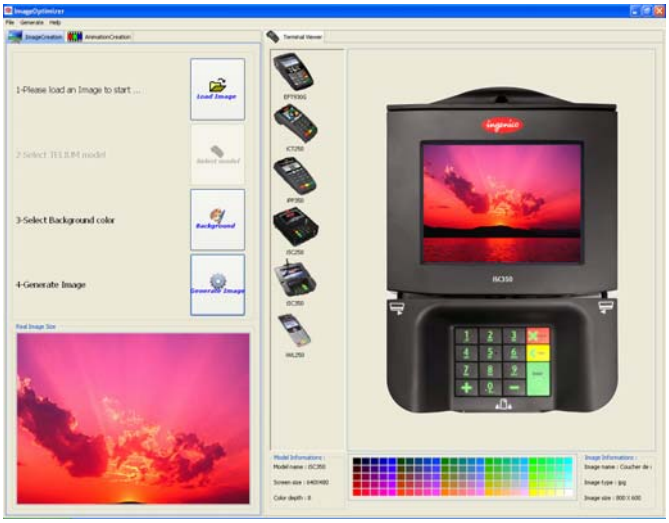
Normal image	Rendering on 4096 colours screen	Dithered image rendered on 4096 colours screen
		

Table 17 : Image dithering solution

A zoom on a part of dithered image:

4.2.2 Which tools can be used ?

INGENICO Software Development KIT currently provides a tool to optimize images: "ImagesOptimizer.exe".



- Set the input picture filename to optimize (wildcard mask accepted) into Input picture filename, the input image extensions supported are jpg or jpeg, png, bmp.
- Select the terminal target where images/Animations will be displayed.
- Select the background colour when image don't fill all terminal screen.
- Select the dithering optimizer (for Isc 350 set 24 bits per pixel, for Ict 250, Eft930 set 16 bits per pixel) :
  - ***Black and white*** : convert into black and white image
  - ***Gray*** : convert into gray scale image
  - ***8 bits per pixel*** : convert in a dithered image with a colour palette coded on 8 bits per pixel (poor quality, low memory)
  - ***16 bits per pixel*** : convert in a dithered image with a colour palette coded on 16 bits per pixel (this is the best quality with a screen limited to 4096 colours)
  - ***24 bits per pixel*** : convert in a dithered image with a colour palette coded on 24 bits per pixel (this is the best quality with a screen limited to 262144 colours)
  - ***32 bits per pixel*** : convert in a dithered image with a colour palette coded on 32 bits per pixel (this is the best quality with a screen which support full colours)
- Press Generate button

For more detail, please refer to ImagesOptimizer User Guide.

The obtained result can be seen in the previous table.