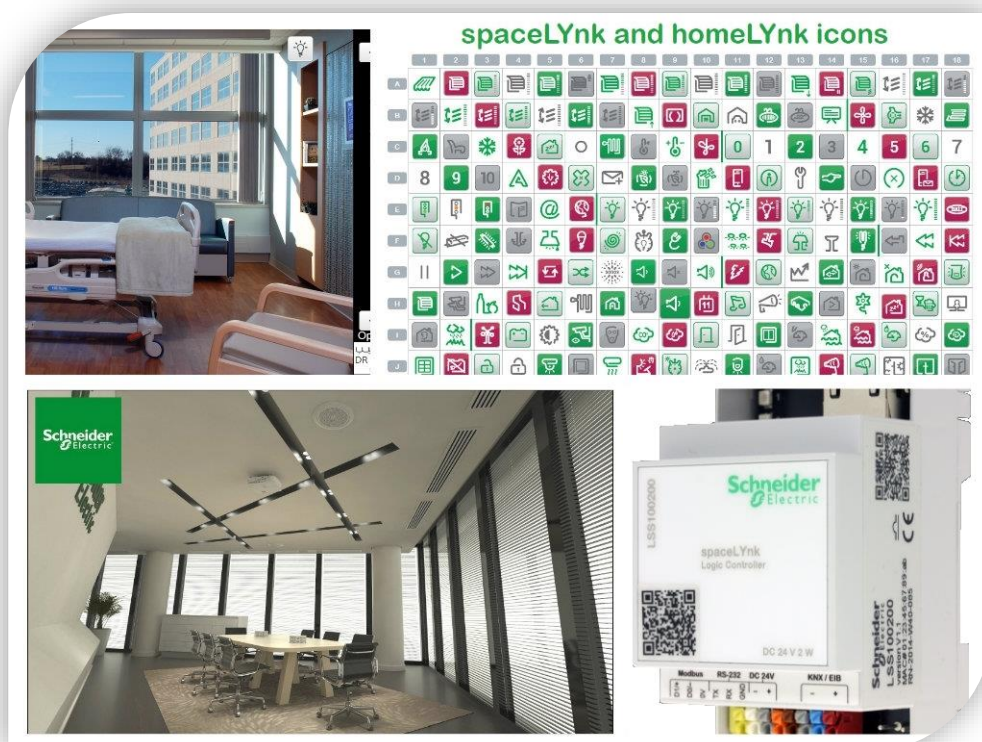


# Application note

## Advanced graphic's tutorial

### How to improve the visualization of your projects



# Safety Information

## Important Information

Read these instructions carefully before trying to install, configure, or operate this software. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

### WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

### CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

### NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

## Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

## Safety Precautions

<b>⚠ WARNING</b>
<p><b>HAZARD OF INCORRECT INFORMATION</b></p> <ul style="list-style-type: none"><li>• Do not incorrectly configure the software, as this can lead to incorrect reports and/or data results.</li><li>• Do not base your maintenance or service actions solely on messages and information displayed by the software.</li><li>• Do not rely solely on software messages and reports to determine if the system is functioning correctly or meeting all applicable standards and requirements.</li><li>• Consider the implications of unanticipated transmission delays or failures of communications links.</li></ul> <p><b>Failure to follow these instructions can result in death, serious injury, or equipment damage.</b></p>

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

No part of this document may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without express written permission of Schneider Electric.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

© 2014 Schneider Electric. All rights reserved

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>7</b>
<b>2</b>	<b>How to improve your visualization .....</b>	<b>8</b>
<b>3</b>	<b>Creating structure of visualization.....</b>	<b>10</b>
3.1	Resolutions.....	10
3.1.1	Full HD display 1920x1080px.....	10
3.1.2	iPad 2048x1536px.....	11
3.2	Layouts.....	11
3.2.1	Photorealistic layout.....	11
3.2.2	3D rendered layout .....	12
3.2.3	Hand-drawn layout.....	13
<b>4</b>	<b>SVG icons .....</b>	<b>15</b>
4.1	Icons poster.....	15
4.2	Hand-drawn icons.....	16
4.3	How to customize icon .....	17
4.4	Icon generators.....	17
4.5	SVG icons preview in Explorer .....	18
<b>5</b>	<b>Overview of software .....</b>	<b>18</b>
<b>6</b>	<b>Tips &amp; tricks .....</b>	<b>19</b>
6.1	Transparent icon.....	19
6.1.1	Gauge's trick.....	21
6.1.2	Background as an Object.....	24
6.2	Control by real devices - skeuomorphism .....	25

6.2.1	Skeuomorphic icon for light.....	26
6.2.2	Curtain skeuomorphic icon.....	28
7	<b>Visualization specification form.....</b>	<b>29</b>
8	<b>Conclusion.....</b>	<b>30</b>
9	<b>Appendix.....</b>	<b>30</b>
9.1	Glossary.....	30

# 1 Introduction

This application note describes process of creation of visualizations as a key part of the integration to achieve maximum potential of spaceLYnk controller. Moreover the application note presents quick tricks, good practices and helpful tools. These tricks are useful to know for integrator as well as for designer to understand needs of realization.

Application note is primary focused on design studios which support integrator of building. It guides designers in understanding building project's background to deliver state of art graphical user interface.

Visualization helps integrator to deliver a comprehensive solution to their client. Definitely the most rated projects benefits from synergy between client, integrator and graphic studio.

A glossary is available in the appendix chapter of this document. Please refer to it whenever necessary.

## Competencies

This document is intended for readers who have been trained on spaceLYnk, spaceLYnk products. The integration should not be attempted by someone who is new to the installation of either products. In addition we recommend that you be familiar with:

- The concepts of visualizations for home controllers, PLCs
- Photography
- Vector, bitmap, 3D render editors

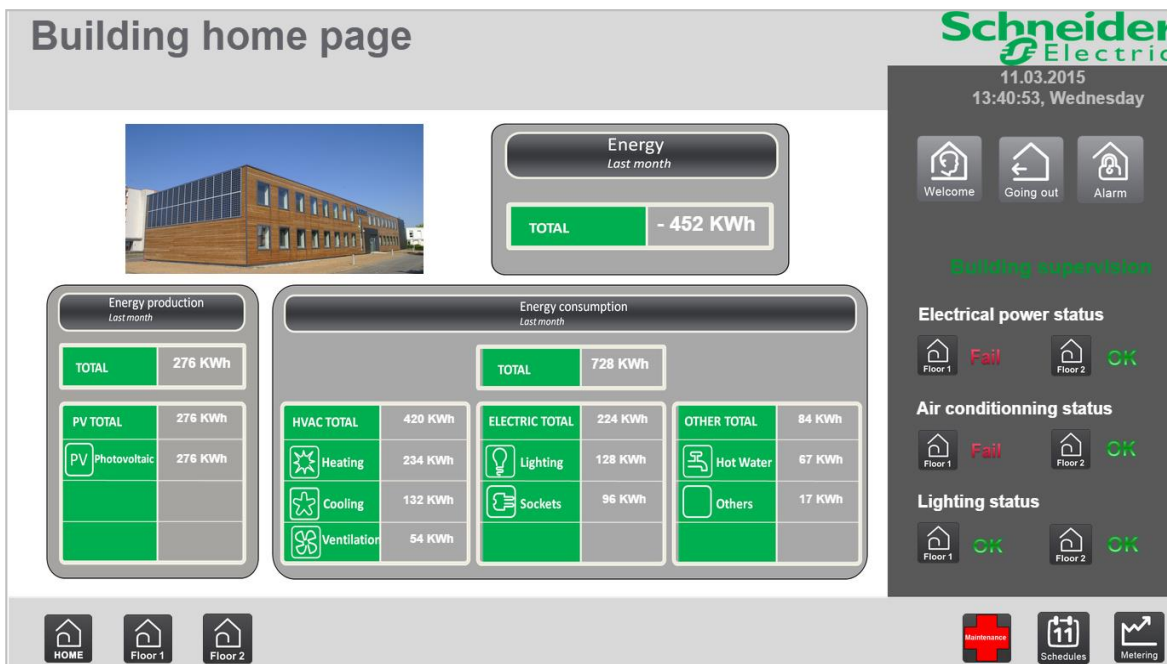
## System prerequisites

Software	Version	Download
spaceLYnk	2.1 and newer	<a href="http://www.schneider-electric.com">http://www.schneider-electric.com</a>

Table 1: software versions of used software

## 2 How to improve your visualization

Visualization is undoubtedly an important part of whole project. Well visualized project wins your contract, badly visualized project threatens obtaining contract. In following pictures you can see example projects which were not well managed.



Picture 1: Main page




Picture 2: Floor 1



This example of visualization has many issues which deteriorate whole project.

Main issues:

- bad placement of elements on layout
  - elements are chaotically distributed on layout
  - wrong dimensions of logo
  - icon **Welcome**  is placed only on main page where it does not make sense. This icon is intended to ensure return to home page
- layout is using CAD drawing as a background
  - there is no reason to have dimensions on layout background
  - rooms which are not controlled must be shown schematically in order to guide user intuitively
  - main icons for navigation have the same design and size as icons for control functions
  - bad choice of colors – low contrast of text and background

## 3 Creating structure of visualization

spaceLYnk is a logic controller with integrated webserver. This webserver is used for visualization of KNX objects. It is possible to visualize all KNX objects independently of their datatype.

Although spaceLYnk can work without any visualization it is better to use benefits which visualizations brings. It can be typical visualization of energy data, facility management or control devices on Modbus or KNX field buses.

### 3.1 Resolutions

spaceLYnk can provide visualization on a wide range of displays. Correct choice of resolution and ratio of the screen (e.g. 4:3 / 16:9) is the key to reach suitable interface for control your devices.

Resolution	Description	Usage
1024x768	XGA resolution	PC workstations, laptops, touch screens
1920x1080	Full HD display	PC workstations, TV
2048x1536	Apple iPad retina	tablets

Table 2: Common resolutions

#### 3.1.1 Full HD display 1920x1080px

Visualization of plan on full HD display.

Resolution of plan	Result
1024x768	Plan is covering approximately 75% of display height, use higher resolution
1920x1080	This resolution is made for this display, looks perfect
2048x1536	iPad resolution – correctly adapted, but due to different ration there are white borders from left and right side

Table 3: Visualization on full HD display

### 3.1.2 iPad 2048x1536px

iPad 4<sup>th</sup> generation has default resolution 2048x1536px on display called Retina

Resolution of plan	Result
1024x768	This resolution is good enough for iPad 4 <sup>th</sup> generation
1920x1080	Correctly adapted, but due to different ration there are white borders from left and right side
2048x1536	2048x1536px is made for this display, looks perfect

Table 4: Visualization on iPad

Main issue is not usually resolution thanks to auto-size up-scaling function but ratio, which leaves white borders on the side of display.

Try to investigate display, tablet which will probably client use for visualization and adapt source graphics to this resolution.

## 3.2 Layouts

Create layout is the first step during creating visualization. Layout defines background of the visualization and preset placement of graphic elements. Layout also defines appearance and placement of control elements as you can see in Picture 4.

There are many types of layouts which can be used. Two most used types are “photorealistic”, 3D rendered” and “hand-drawn” layout.

### 3.2.1 Photorealistic layout

We recommend you to use photo e.g. office as a background. Great choice is using fisheye lens which produce photos with angle of view between 100 and 180 degrees. Fisheye lenses achieve wide angles of view by forgoing producing images with straight lines of perspective. This gives images a characteristic convex non-rectilinear appearance.

For better look of picture for layout we recommend **remapping to rectilinear perspective** by software or use **rectilinear lens** because fisheye lens produces distinctly curvilinear, wide-angled results.

Fisheye lens simply covers more space which is displayed on the screen. You can see an example in Picture 3.



Picture 3: Photorealistic layout

### 3.2.2 3D rendered layout

3D rendered layout has unquestioned meaning for visualization. Main benefit is that author can create visualization before building is ready to use. Moreover author has complete freedom in creating visualization. You can see an example in following picture.



Picture 4: 3D rendered layout

There are many professional 3D modeling and rendering software applications like 3DS MAX, Rhinoceros, Blender. On the other hand you can use software for planning homes. There is really huge number of these software installable or running in web browser.

As a good free software we recommend AUTODESK® HOMESTYLER in which you can work in web browser <http://www.homestyler.com/> or Google SketchUp <http://www.sketchup.com/>

Software for planning home are much more easy to use than professional 3D software applications.

### 3.2.3 Hand-drawn layout

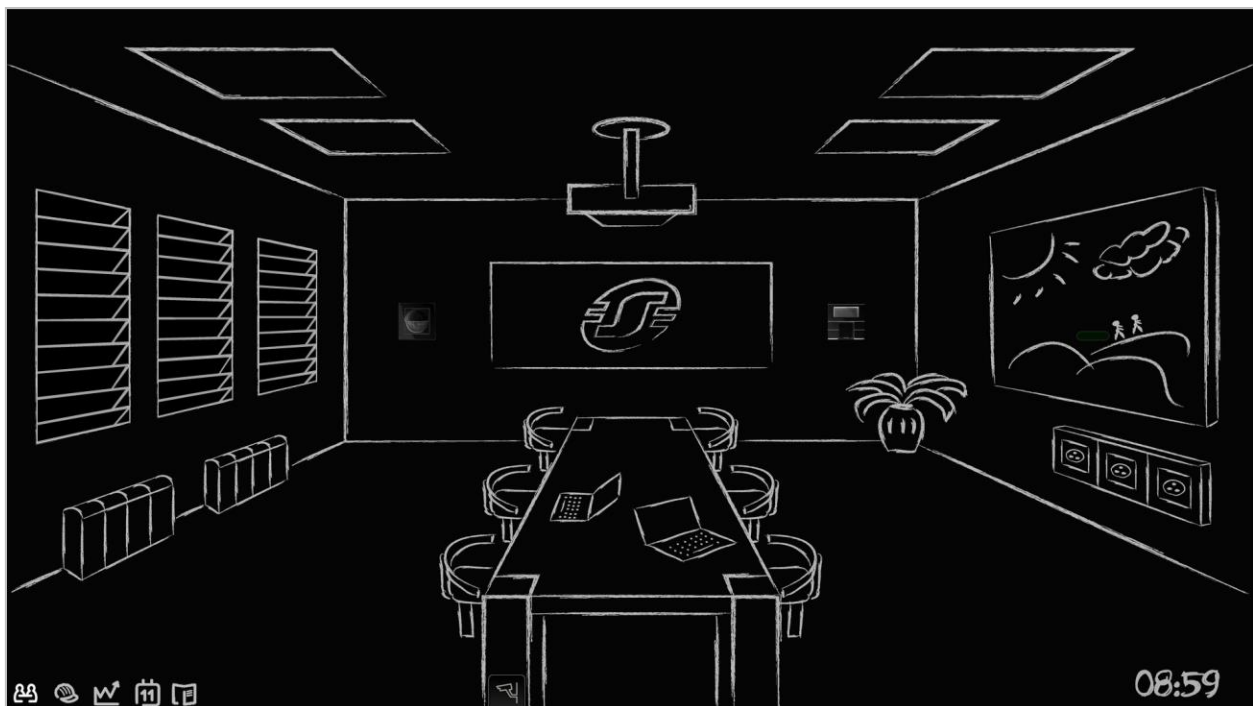
The last type of layout is hand-drawn layout. It is mainly used for creating specific design look of visualization.

Main tools for creation of hand-drawn layout are vector graphic editors. As a main representative tool we recommend Adobe Illustrator marketed by Adobe Systems. In addition we must mention also representative of open source software named Inkscape. All of these software are used for creation of layout using vector graphic with following export to bitmap graphic.

We used hand-drawn layout to unification of graphic on demo box and visualization.

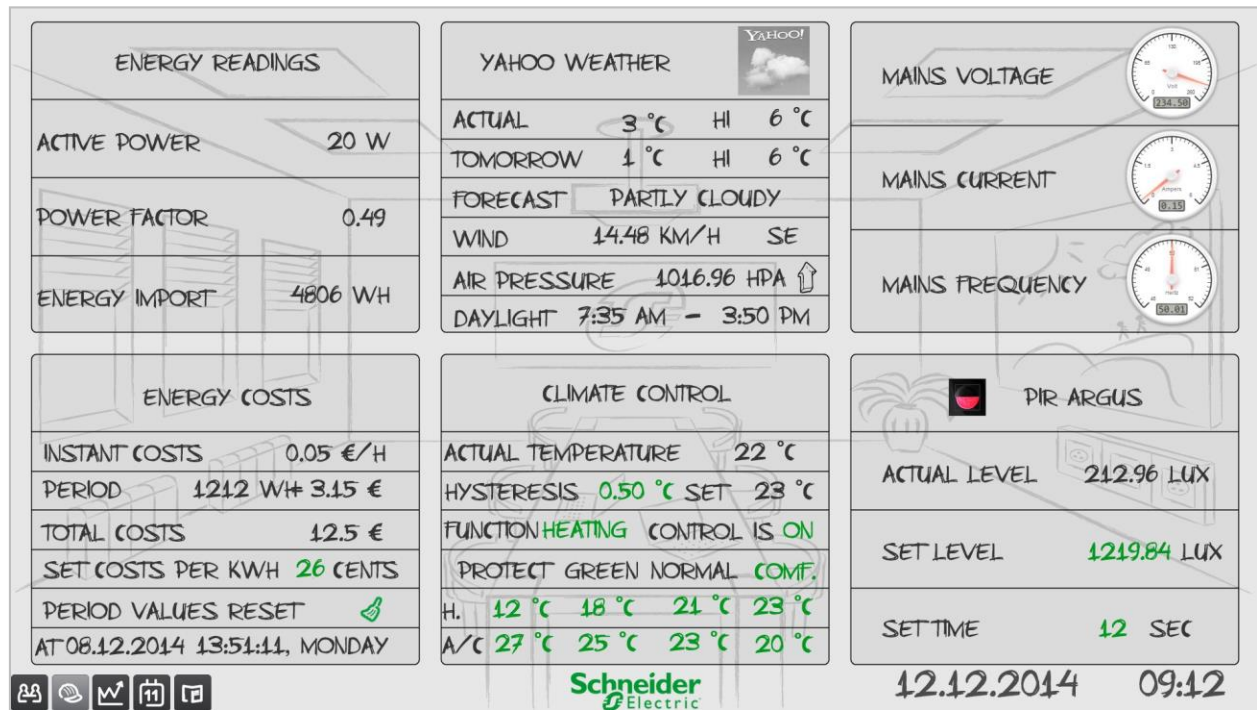


Picture 5: Demo box



Picture 6: Demo box visualization - main page





Picture 7: Demo box visualization - facility management

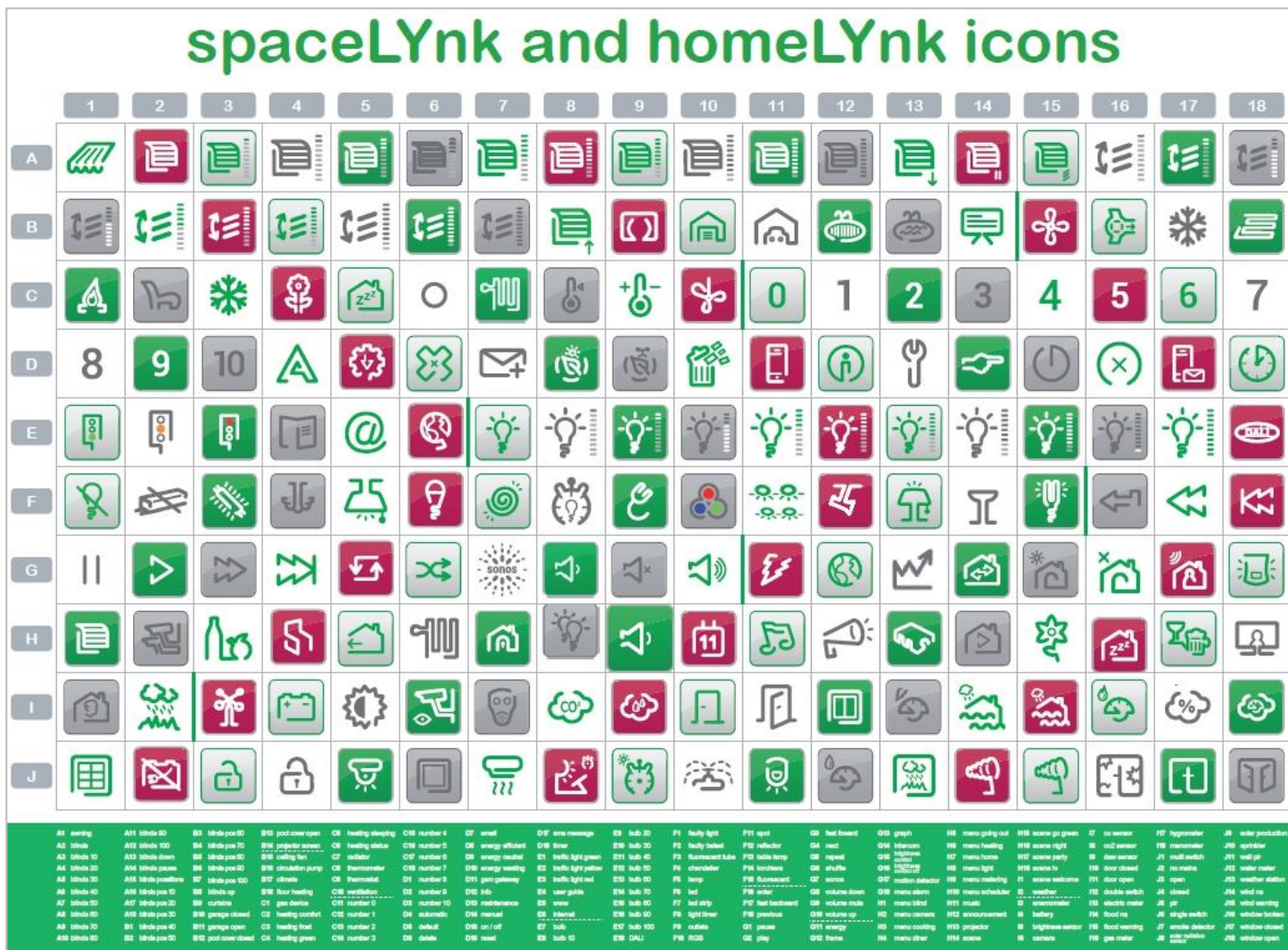
## 4 SVG icons

SpaceLYnk is delivered with starting package of SVG icons. This icon package is located in *Configurator -> Utilities -> Vis. graphics -> Icons*

Using these premade icons significantly saves time needed for creating visualization.

### 4.1 Icons poster

Icons poster is available on Schneider Electric website. This poster will help you to select best suited icon for the desired function.



Picture 8: Icons poster

## 4.2 Hand-drawn icons

In case of need it is possible add icons created for specific functions. We highly recommend use SVG format for icons instead bitmap graphic formats like JPEG, PNG, GIF.

Scalable Vector Graphics (SVG) is an XML-based vector image format for two-dimensional graphics with support for interactivity and animation. SVG specification is an open standard.

Graphic editors like Adobe Illustrator, CorelDraw and Inkscape are good choice for this propose due native support of this format.

We recommend using icons with dimensions 56 x 56 px or 114 x 114 px with transparent background as we use for original icons.



## 4.3 How to customize icon

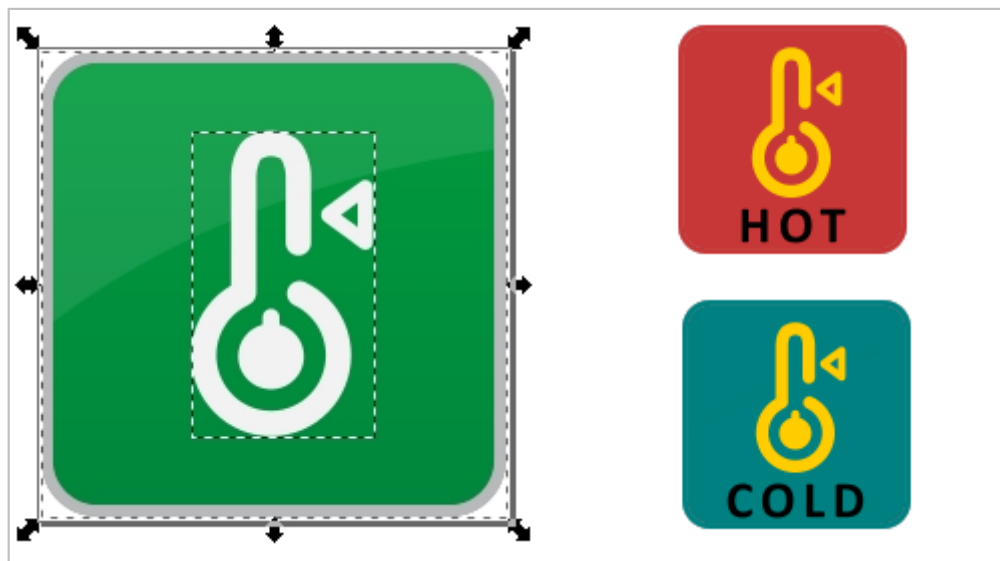
Icons are delivered without texts and with a preselected colors. For icon customization you can use Inkscape editor.

Steps:

1. Go to *Configurator -> Vis. graphics -> Icons*
2. **Right click** on icon and download it
3. Open downloaded icon in Inkscape editor

Icon shown in Picture 9 have 2 selectable elements (thermometer and background).

4. Select (F1) area which you want to change
5. Change appearance of elements ( e.g. element shift, color background, add text)
6. Save and add icon back to spaceLYnk



Picture 9: Icon customization

Using Inkscape graphical editor you can modify icons according to your requirements.

## 4.4 Icon generators

There are many icon generators on the internet which can be directly customized over web browser.

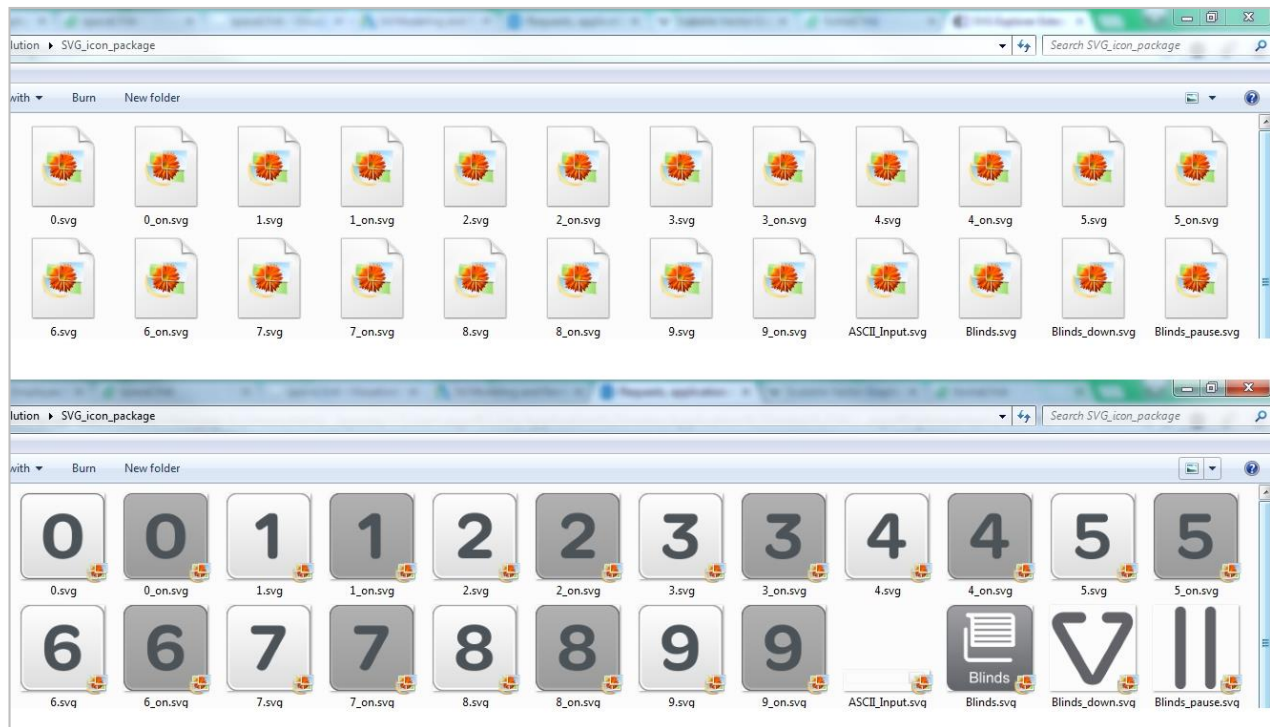
<http://iconizer.net/>

<http://fontello.com/>

## 4.5 SVG icons preview in Explorer

There is missing rendering SVG thumbnails in Microsoft Windows Explorer. To add this feature into Explorer might be used SVG Viewer Extension for Windows Explorer. Extension is available here:

<https://svgextension.codeplex.com/>



Picture 10: SVG Viewer Extension installed (before – after)

## 5 Overview of software

Adobe Photoshop	Bitmap graphic editor	Commercial	<a href="http://www.adobe.com/">http://www.adobe.com/</a>
Pixelmator	Bitmap graphic editor	Commercial	<a href="http://www.pixelmator.com/">http://www.pixelmator.com/</a>
Paint.net	Bitmap graphic editor	Free	<a href="http://www.getpaint.net/">http://www.getpaint.net/</a>
Gimp	Bitmap graphic editor	Open source	<a href="http://www.gimp.org/">http://www.gimp.org/</a>
Adobe Illustrator	Vector graphic editor	Commercial	<a href="http://www.adobe.com/">http://www.adobe.com/</a>
Adobe Fireworks	Vector graphic editor	Commercial	<a href="http://www.adobe.com/">http://www.adobe.com/</a>

Corel Draw	Vector graphic editor	Commercial	<a href="http://www.corel.com/">http://www.corel.com/</a>
Inkscape	Vector graphic editor	Open source	<a href="https://inkscape.org/">https://inkscape.org/</a>
Homestyler	Design software	Free	<a href="http://www.homestyler.com/">http://www.homestyler.com/</a>
Floorplanner	Design software	Commercial	<a href="http://en.floorplanner.com/">http://en.floorplanner.com/</a>
Google SketchUp	Design software	Free / Commercial	<a href="http://www.sketchup.com/">http://www.sketchup.com/</a>
3ds Max	Rendering software	Commercial	<a href="http://www.autodesk.com/products/3ds-max/">http://www.autodesk.com/products/3ds-max/</a>
Rhinoceros	Rendering software	Commercial	<a href="https://www.rhino3d.com/">https://www.rhino3d.com/</a>
Blender	Rendering software	Open source	<a href="http://www.blender.org/">http://www.blender.org/</a>

## 6 Tips & tricks

This chapter is focused on qualitative improvement of the process of creating a visualizations.

Important: All these practices are available in project backup which is part of this application note.

**Note:** Pay attention to selection of suitable background color before you start. Using of dark scheme can cause illegibility of text or other elements which were designed black.

### 6.1 Transparent icon

There are three options how to use icons for control devices. Common way is use premade or self made icons. The second option is used transparent icon ("empty.svg") available in spaceLYnk. Transparent icon allows you control physical device over graphic widget which looks like as same as real device.



Picture 11: Widget of real device (right) with transparent icons (green highlighted)

Steps:

1. Use transparent icon available in Configurator -> Vis. graphics
2. Create widget with real device
3. Place transparent icon over button of real device as Object
4. Customize transparent icon dimension as the real one
5. Assign functionality to this icon.

Plan editor

Object Link Text label Image Frame Gau

Main object: 0/1/0 Window 1

Status object: Use main object

Custom name:

Read-only:

Hide in Smartphone:

Hide background: ☒

Send fixed value:

No bus write: ☐ In PC/Tablet/Smartphone

Pin code:

Widget: No widget

Display mode: Icon

Smartphone icon: x

On icon: empty.svg

Off icon: empty.svg

Additional classes:

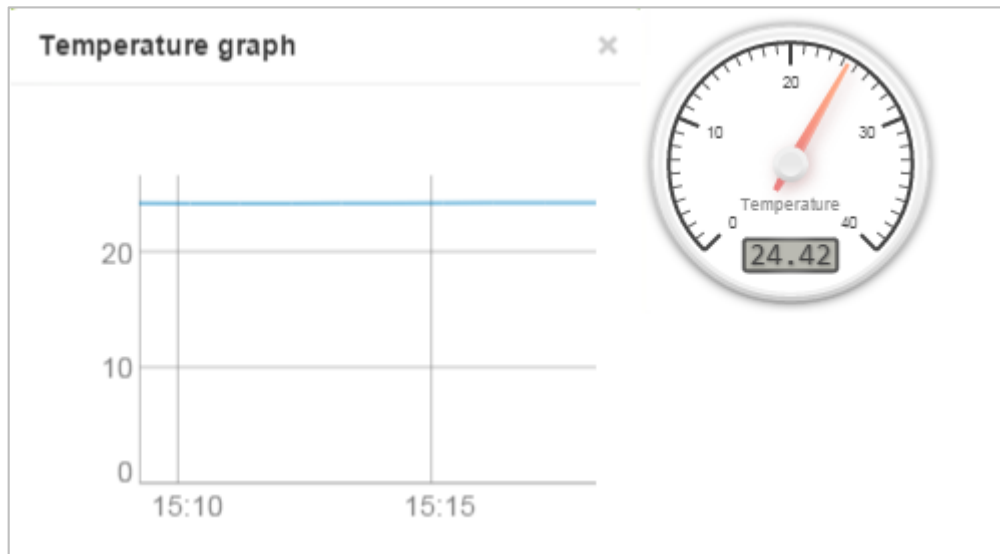
Show control: ☐ Inline in PC/Tablet

Apply Cancel

Picture 12: Assign functionality for empty icon

### 6.1.1 Gauge's trick

Transparent icon can be also used for extension of gauge's functionality. Gauge's primary function is graphical representation of value.



Picture 13: Temperature gauge

Using transparent icon according steps listed in chapter 6.1 gauge can show graph after click on them.

Steps:

1. Use transparent icon available in Configurator -> Vis. graphics
2. Place and configure Gauge to your visualization
3. Place transparent icon over gauge as Graph
4. Customize transparent icon dimension as Graph
5. Assign functionality to this icon

Plan editor

← **Label** Image Frame Gauge Camera **Graph** →

Data object: 0/0/3 Temperature ▼

Custom name: Temperature graph

Icon: empty.svg ▼

Window size: 320 240

Number of points: 10

Auto open window: ☐

Hide background: ☒

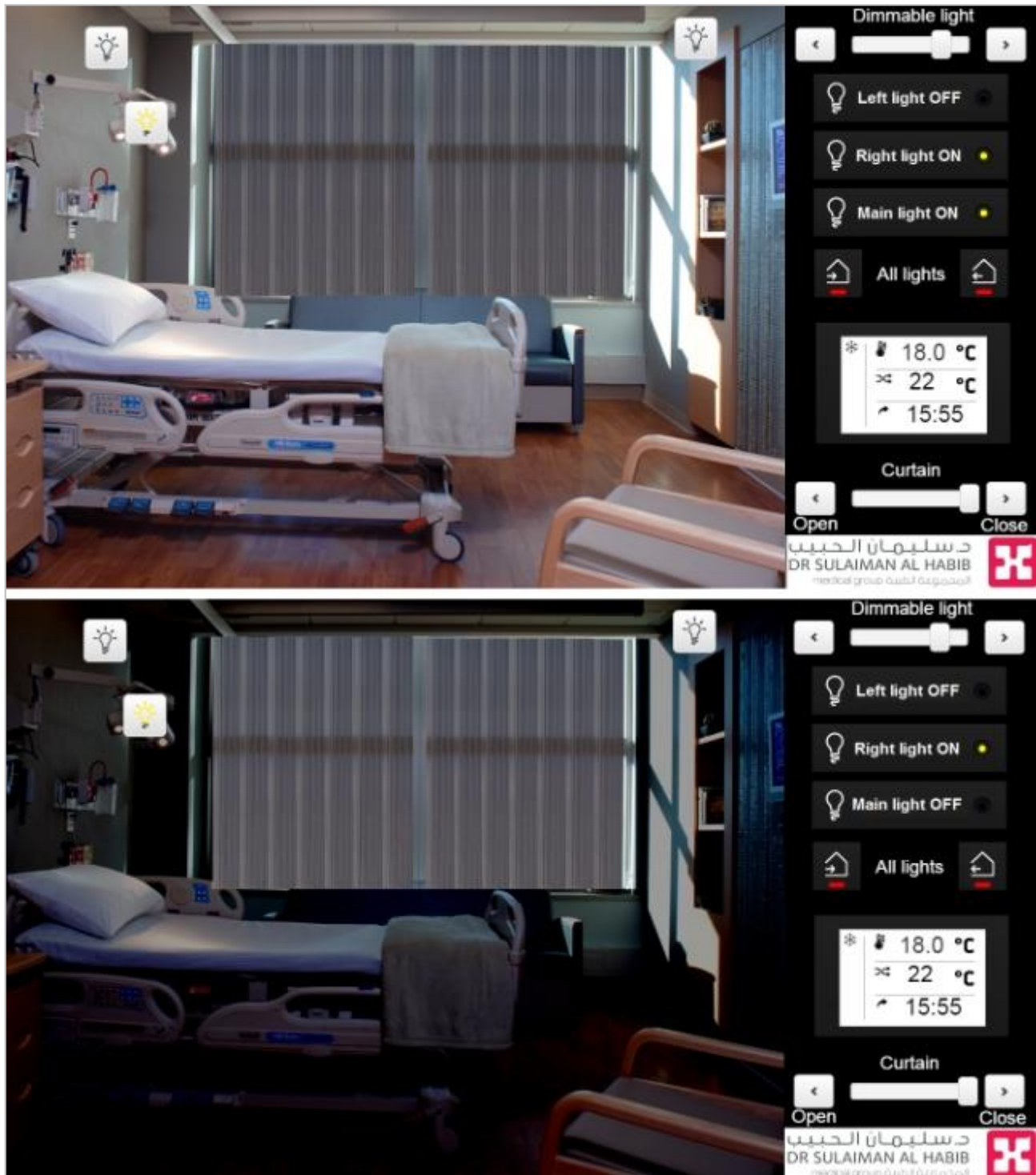
Additional classes:

Apply Cancel

Picture 14: Assign functionality (open graph) to empty icon

## 6.1.2 Background as an Object

You can use this trick with transparent icon to change background when central light switch is ON and simulate empty room or night mode. The procedure is similar as for Gauges described in previous chapter.



Picture 15: Background as an object



## 6.2 Control by real devices - skeuomorphism

Third option how to control devices with real looking device is cut out part of device and transform it to icon.

*Skeuomorphism is a physical ornament or design on an object copied from a form of the object when made from another material or by other techniques.*

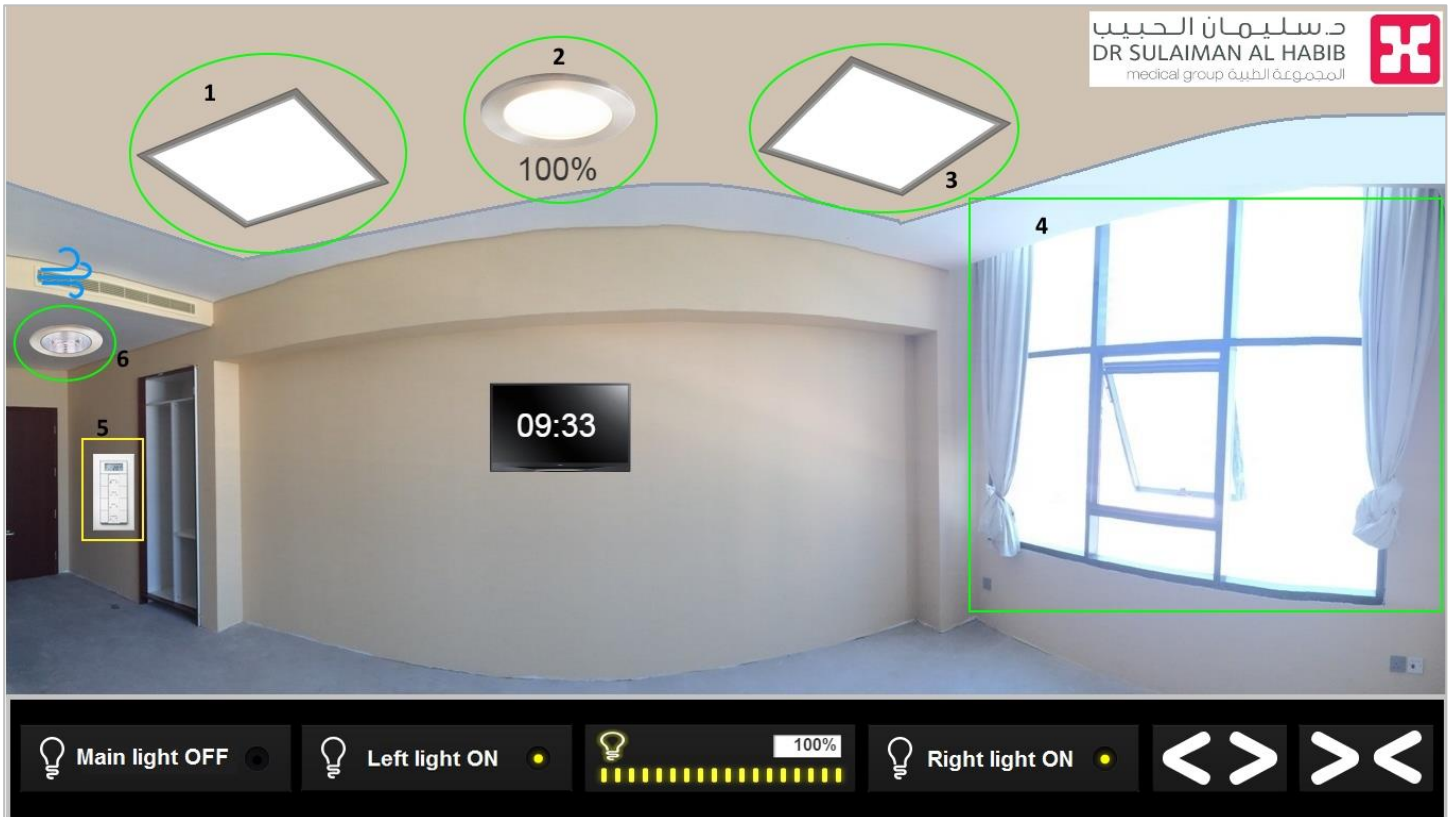
Available: <http://dictionary.reference.com/browse/skeuomorph?s=t>

(definition from <http://dictionary.reference.com>)

- *In a nutshell: The control element is inspired of life-like controls*



Picture 16 : Common control of devices by icons



Picture 17: Skeuomorphism control

Thanks to skeuomorphism principle is user able to control devices just by click on graphic representation of device without any additional icon. Moreover graphic element change look according device status.

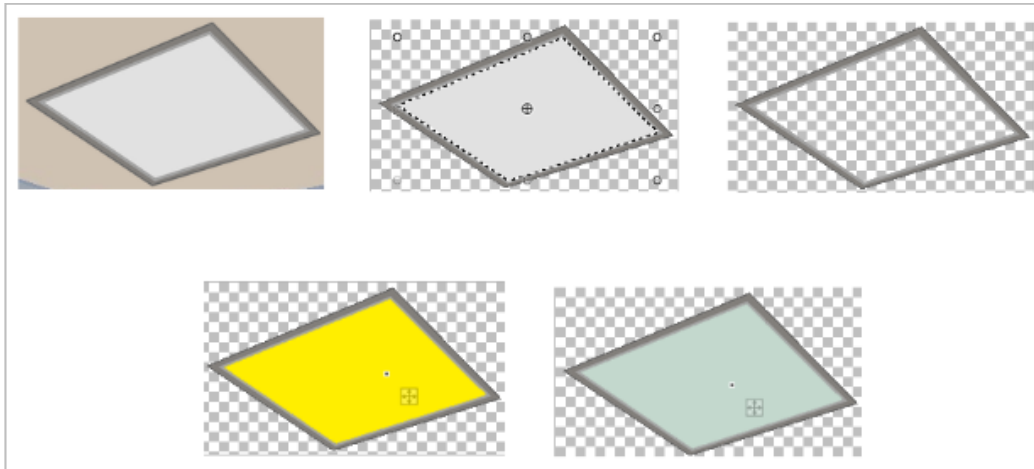
### 6.2.1 Skeuomorphic icon for light

I will demonstrate procedure on light icon (1) in Picture 17.

1. Cut of light from visualization
2. Erase background using selection, magic wand tool etc. in graphic editor and make selection of inner part of light
3. Erase selected inner part of light
4. Fill the inner part of light with color for ON and OFF status (Paint Bucket tool)
5. Save to hard disc in png format due to preserve transparency
6. Add icon to spaceLYnk
7. Assign functionality to this icon

Light icon is prepared to place in visualization with two (ON and OFF) status.

All steps you can see in the Picture 18.



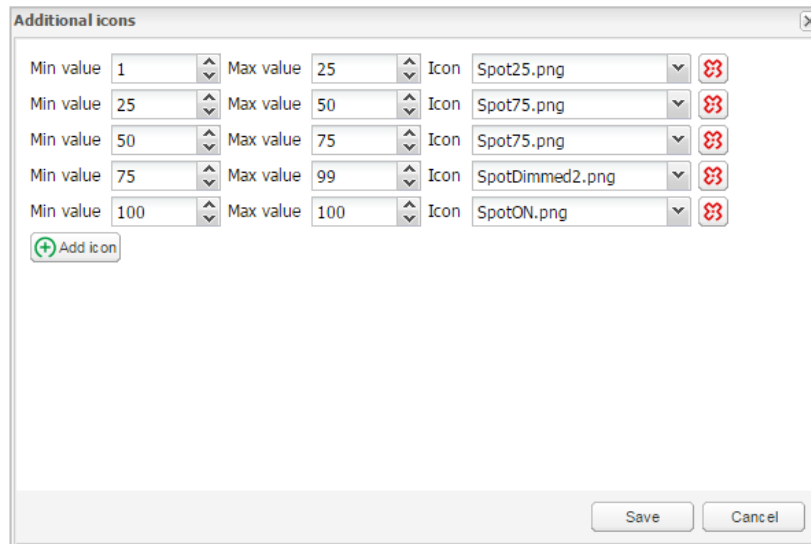
Picture 18: ON and OFF status icon – real device

Using skeuomorphism in your project you will be able to deliver visualization with friendly user interface without disturbing elements.

In case of dimmable devices like light (2) in picture 17 you can follow the same procedure as light (1) case. Just create more icons with intensified yellow color and save them with dedicated extension which indicates dimming level eg. \_25, \_50.



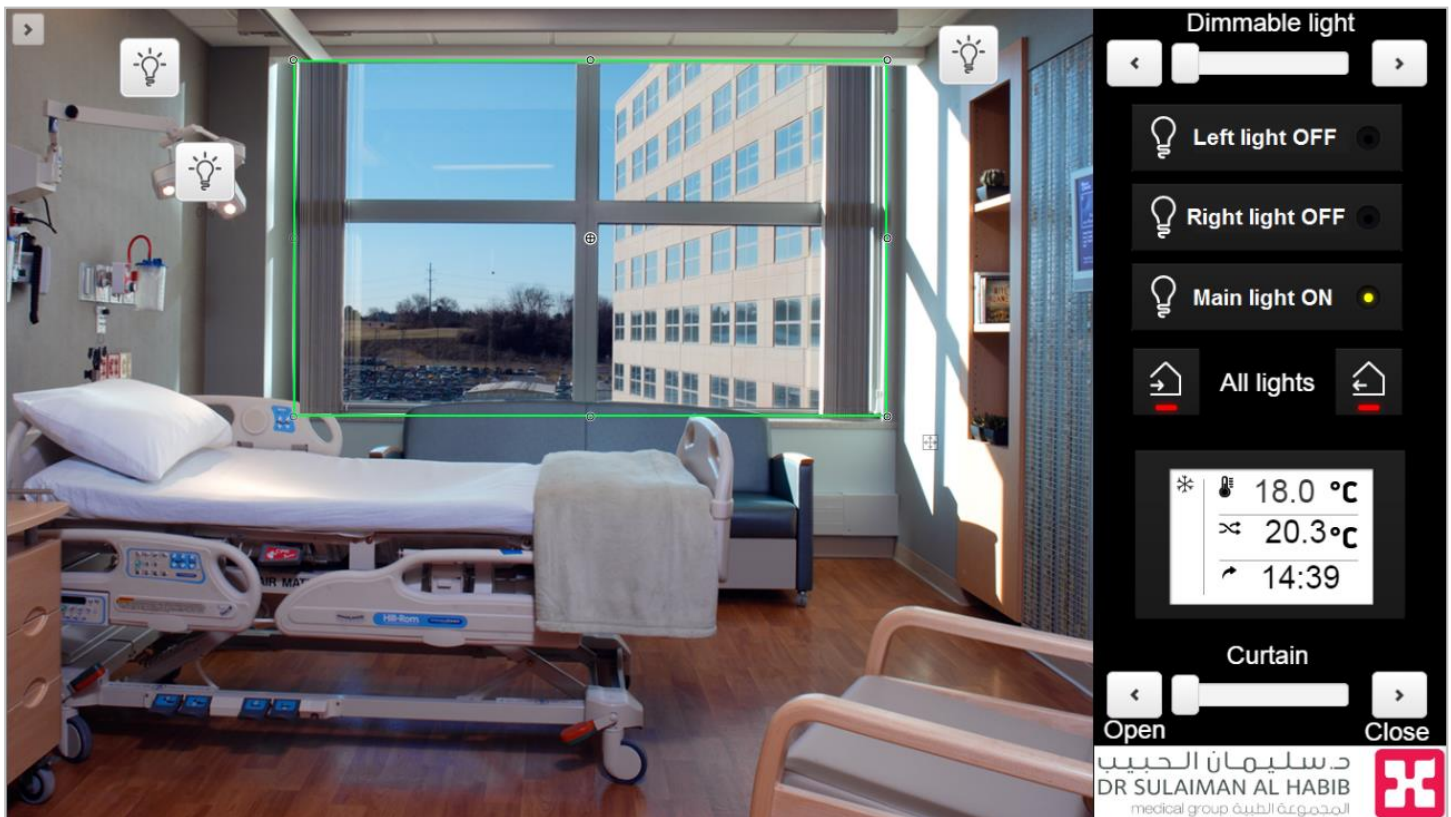
Picture 19: Dimming icons



Picture 20: Configure additional icons for dimming function

## 6.2.2 Curtain skeuomorphic icon

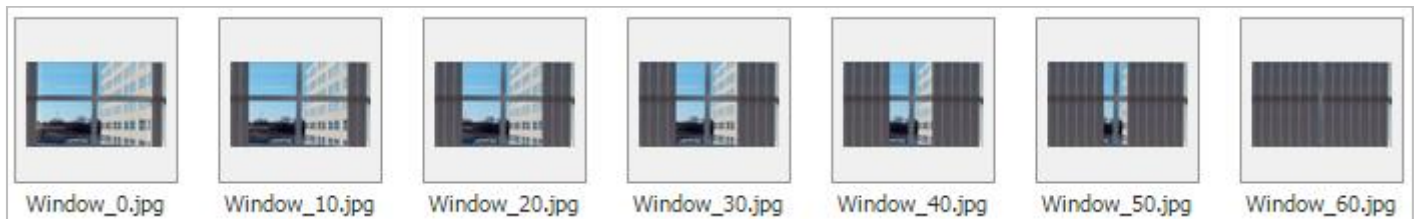
As a last example let we try to animate the curtains in hospital room. Procedure is similar as for dimming function.



Picture 21: Hospital room with curtains in window

Steps:

1. Cut of window from visualization
2. Erase background using selection, magic wand tool etc. in graphic editor and make selection of inner part of window
3. Erase selected inner part of window
4. Make selection of curtain
5. Copy them to new layer and shift to new position
6. Save to hard disc in png format due preserve transparency
7. Continue until the window is not completely covered (Save after each shift)
8. Add icons to spaceLYnk
9. Assign functionality to these icons



Picture 22: Animated curtains

## 7 Visualization specification form

You can use form enclosed to this application note for clear requirements to visualization and modify in case of needs.

## 8 Conclusion

This document describes creation potential of visualization for spaceLYnk controller. It is very useful to become familiar with this application note if you are designer or integrator. Knowledge, procedures and tricks mentioned in this application note can help you to attract client's attention and to create well looking modern visualization which is easy to use.

## 9 Appendix

### 9.1 Glossary

The following table describes the acronyms and defines the specific terms used in this document.

Abbreviation	Description
SVG	Scalable vector graphic
PLC	Programmable logic controller
GUI	Graphical User Interface

Table 5: specific terms

Schneider Electric Industries SAS

Head Office

35, rue Joseph Monier

92506 Rueil-Malmaison Cedex

FRANCE

[www.schneider-electric.com](http://www.schneider-electric.com)