

Workshop Creating dynamic SVG Graphics

Intern

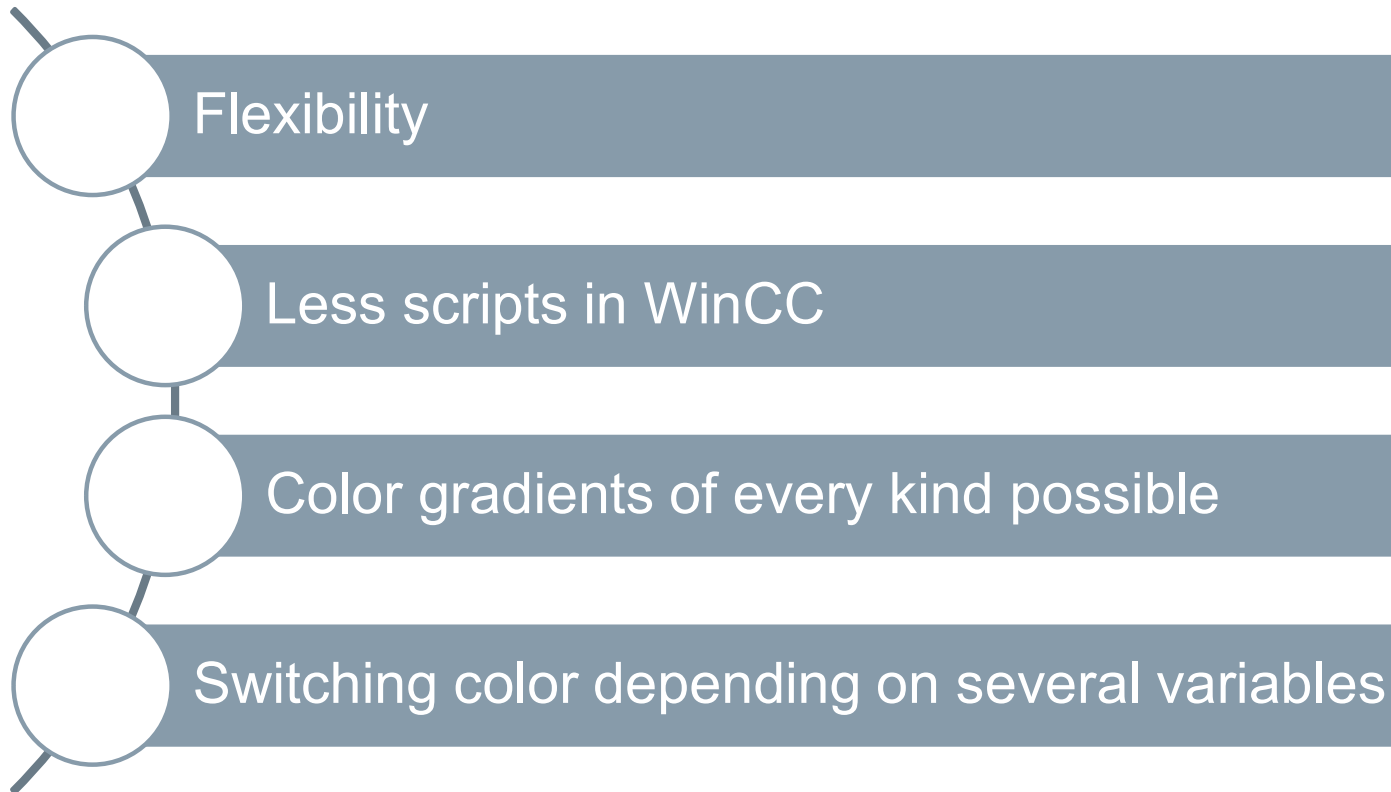
Agenda



Advantages	Procedure	Creating SVG with Inkscape
Preparing SVG for WinCC in Notepad++	Dynamize the SVG	SVG Binding Studio
Restrictions		

Advantages

Advantages



Procedure

Procedure

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Creating
SVG

Dynamize
the SVG

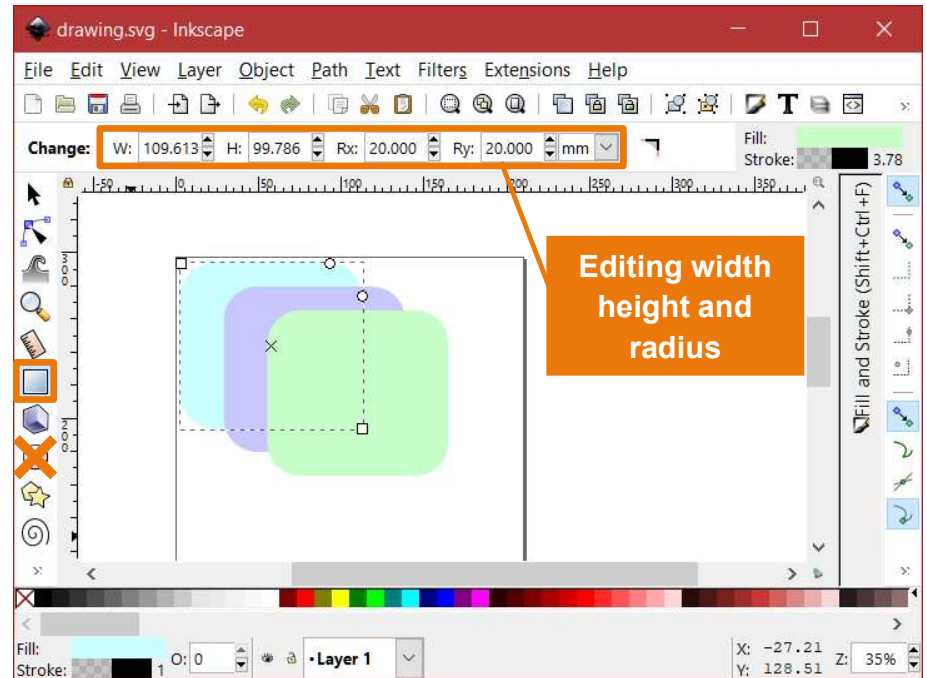
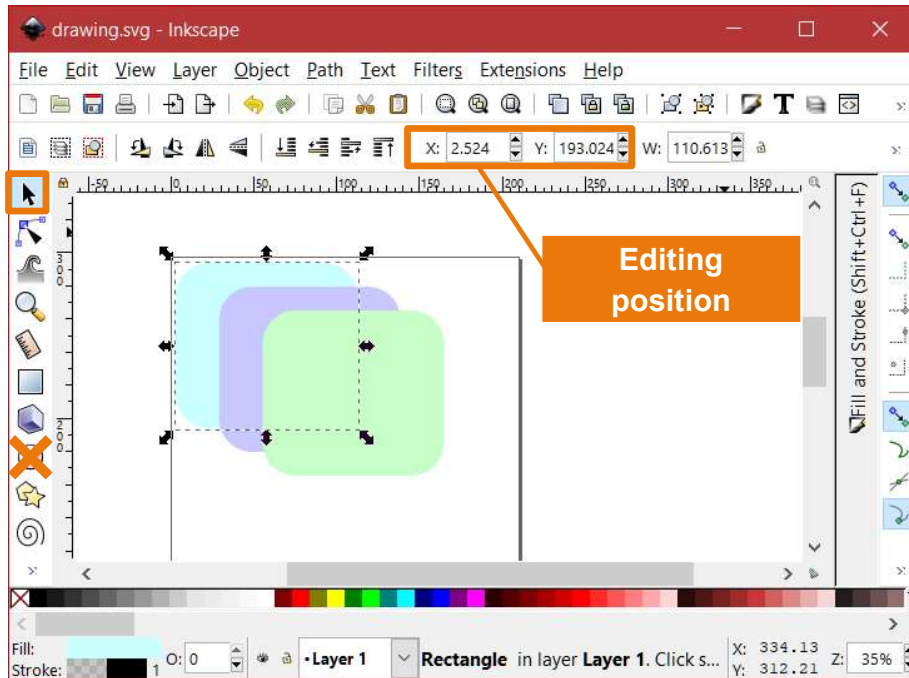
Preparing
SVG for
WinCC



Creating SVG with Inkscape

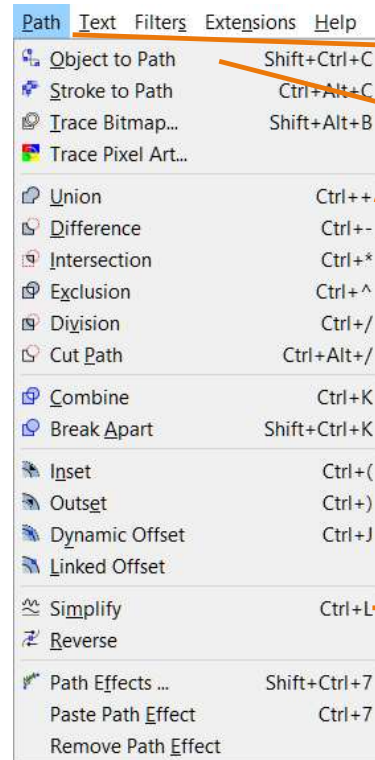
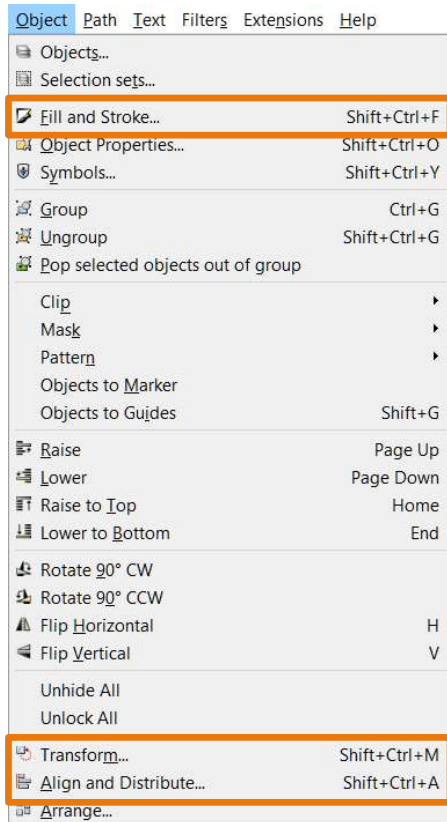
Creating SVG with Inkscape Editing Element

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Creating SVG with Inkscape

Most important editing tools



All path functions convert the objects into a path

Object to Path

Combining several elements to one element

Cutting out one element out of another

This function is for simplifying the path of an object

★ = Can help when something can't be displayed in WinCC

Creating SVG with Inkscape

Defining SVG size

The screenshot shows the Inkscape interface with the 'Document Properties' panel open. The panel has tabs for 'Page', 'Guides', 'Grids', 'Snap', 'Color', 'Scripting', 'Metadata', and 'License'. The 'General' tab is active, showing 'Page Size' settings. The 'Custom size' section has 'Width' set to 164.00000 and 'Height' set to 130.00000, with 'Units' set to 'mm'. The 'Scale' section shows 'Scale x' and 'Scale y' both at 1.00000. The 'Background' section has 'Show page border' checked. The 'Border' section has 'Show page border' checked. The 'Display' section has 'Use antialiasing' checked. The drawing area contains three overlapping squares: a light blue one at the back, a purple one in the middle, and a green one at the front. An orange box highlights the 'File' menu in the top toolbar, with an arrow pointing to it from an orange text box. Another orange box highlights the 'Width' and 'Height' fields in the 'Custom size' section, with an arrow pointing to it from an orange text box. A third orange box highlights the three overlapping squares, with an arrow pointing to it from an orange text box. A fourth orange box highlights the 'Width' and 'Height' fields in the 'Custom size' section, with an arrow pointing to it from an orange text box.

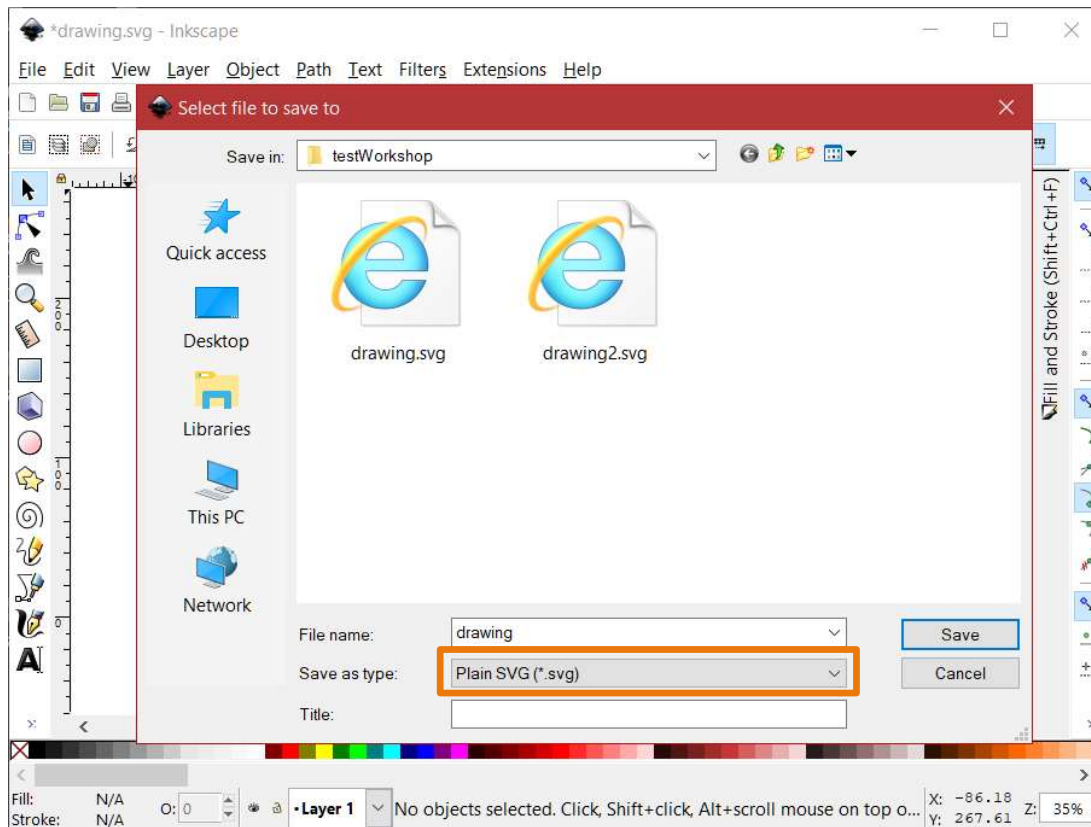
In the file menu the document properties can be opened

Select all elements to get the width and height of all elements together

Define the width and height of the svg graphic in total

Creating SVG with Inkscape Save SVG as Plain SVG

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It is useful to simplify the path elements before saving (see slide „Creating SVG with Inkscape Most important editing” tools)

LIVE DEMO



Show following path functions:

- Combine
- Difference
- Convert rectangle to path
- Show the path points
- stroke to path
- Simplify

HandsOn Creating Alarm icon

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H A N D S O N

in 10 min



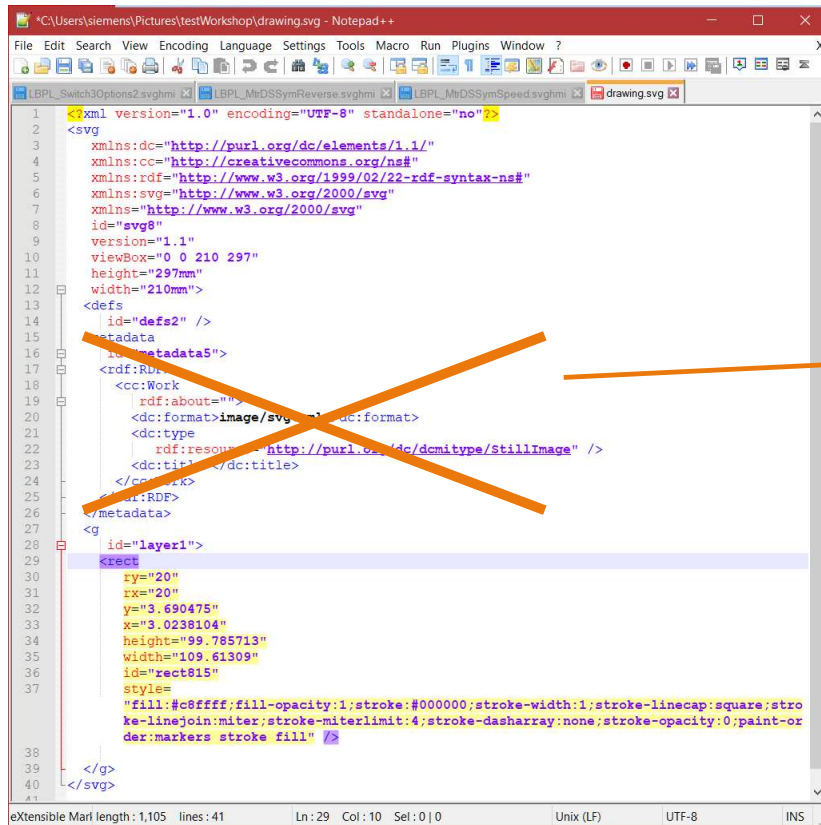
Create you own alarm icon

- Use the path functions to combine elements
- Simplify the path elements at the end

Preparing SVG for WinCC in Notepad++

Preparing SVG for WinCC in Notepad++

Deleting rdf area



```
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <svg
3   xmlns:dc="http://purl.org/dc/elements/1.1/"
4   xmlns:cc="http://creativecommons.org/ns#"
5   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
6   xmlns:svg="http://www.w3.org/2000/svg"
7   xmlns="http://www.w3.org/2000/svg"
8   id="svg8"
9   version="1.1"
10  viewBox="0 0 210 297"
11  height="297mm"
12  width="210mm">
13  <defs
14    id="defs2" />
15  <metadata
16    id="metadata5">
17    <rdf:RDF>
18      <cc:Work>
19        <rdf:about="" />
20        <dc:format>image/svg+xml</dc:format>
21        <dc:type>
22          <rdf:resource="http://purl.org/dc/dcmitype/StillImage" />
23        <dc:title>
24          </dc:title>
25        </cc:Work>
26      </rdf:RDF>
27    </metadata>
28  <g
29    id="layer1">
30    <rect
31      ry="20"
32      rx="20"
33      y="3.690475"
34      x="3.0238104"
35      height="99.785713"
36      width="109.61309"
37      id="rect815"
38      style="fill:#c8ffff;fill-opacity:1;stroke:#000000;stroke-width:1;stroke-linecap:square;stroke-linejoin:miter;stroke-miterlimit:4;stroke-dasharray:none;stroke-opacity:0;paint-order:markers stroke fill" />
39    </g>
40  </svg>
```

Open the SVG graphic in Notepad ++ and delete the metadata area

Preparing SVG for WinCC in Notepad++ Deleting and separating style properties

1. Deleting unused style properties

- Open svg in a browser and Notepad++ in parallel
- Delete a few properties and have look in the browser if something changes

```
style=
"fill:#c8ffff,fill-opacity:1,stroke:#000000,stroke-width:1,stroke-linecap:square,stroke-linejoin:miter,stroke-miterlimit:4,stroke-dasharray:none,stroke-opacity:0,paint-order:markers stroke fill" />
```

2. Separate style property to single properties

```
style="fill:#c8ffff" → fill="#c8ffff"
```

Preparing SVG for WinCC in Notepad++ Replace the header

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```
<svg
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:cc="http://creativecommons.org/ns#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:svg="http://www.w3.org/2000/svg"
  xmlns="http://www.w3.org/2000/svg"
  id="svg8"
  version="1.1"
  viewBox="0 0 101 101"
  height="101mm"
  width="101mm">
```

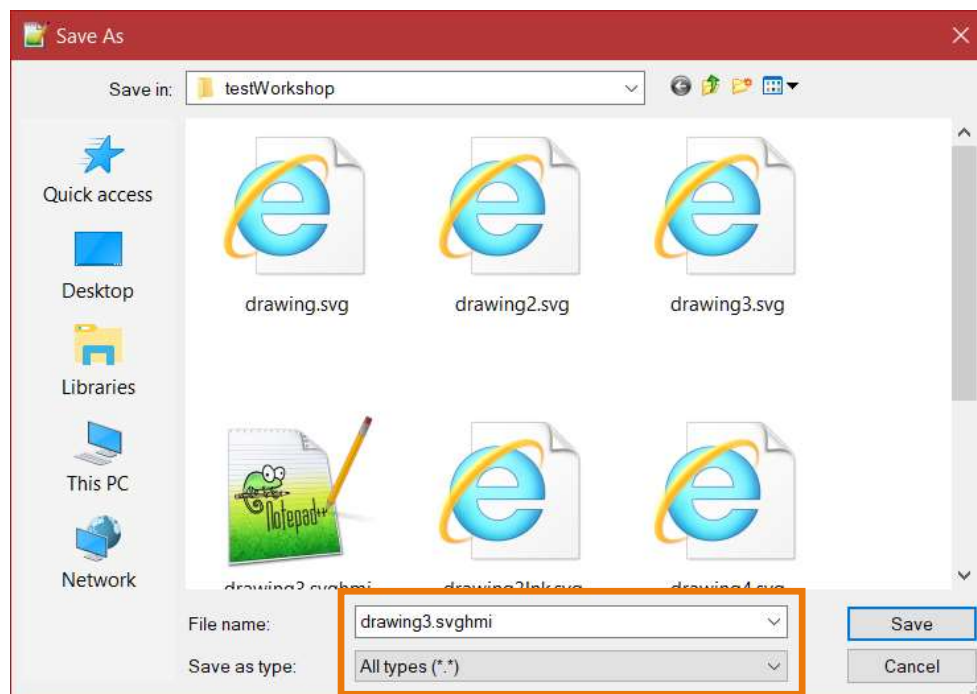


```
<svg
  xmlns="http://www.w3.org/2000/svg"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:hmi-bind-xlink="http://svg.siemens.com/hmi/bind/xlink/"
  xmlns:hmi="http://svg.siemens.com/hmi/"
  xmlns:hmi-bind="http://svg.siemens.com/hmi/bind/"
  xmlns:hmi-element="http://svg.siemens.com/hmi/element/"
  xmlns:hmi-feature="http://svg.siemens.com/hmi/feature/"
  xmlns:hmi-event="http://svg.siemens.com/hmi/event/"
  viewBox="0 0 101 101">
```

Everything except the
viewBox can be replaced

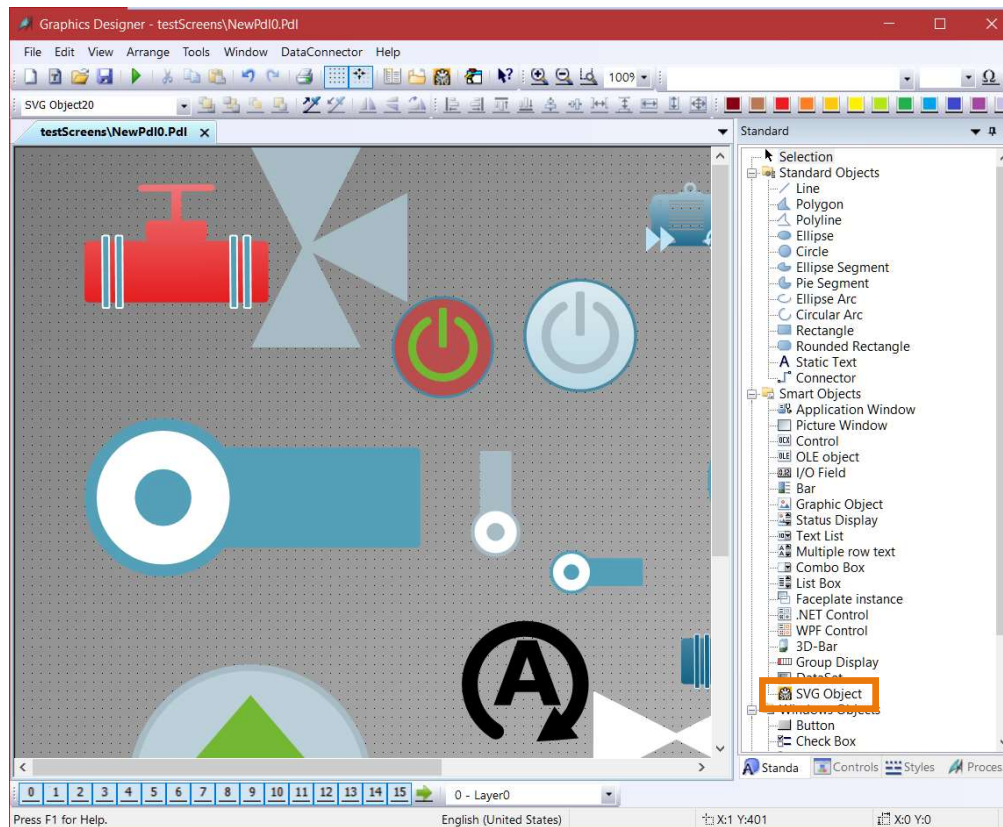
Preparing SVG for WinCC in Notepad++ Save SVG as „.svgghi“

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Preparing SVG for WinCC in Notepad++ Including dynamic SVG in WinCC for testing

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H A N D S O N

in 10 min



Prepare the SVG

- Delete rdf-Area
- Separate the style properties
- Replace the header
- Save SVG as „.svghmi“ file
- Including SVG in WinCC

Dynamize the SVG

Dynamize the SVG

Structure of dynamic SVG

```
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <svg
3   xmlns="http://www.w3.org/2000/svg"
4   xmlns:xlink="http://www.w3.org/1999/xlink"
5   xmlns:hmi-bind="http://svg.siemens.com/hmi/bind/xlink/"
6   xmlns:hmi="http://svg.siemens.com/hmi/"
7   xmlns:hmi-bind="http://svg.siemens.com/hmi/bind/"
8   xmlns:hmi-element="http://svg.siemens.com/hmi/element/"
9   xmlns:hmi-feature="http://svg.siemens.com/hmi/feature/"
10  xmlns:hmi-event="http://svg.siemens.com/hmi/event/"
11  viewBox="0 0 206 206">
12   <hmi:self type="widget" displayName="Cmd" name="extended.Cmd" version="1.0.1" performanceClass="L">
13     <hmi:paramDef name="msgStatusSpeedLevel2" type="boolean" default="false"/>
14   </hmi:self>
15   <metadata
16     id="metadata898">
17   </metadata>
18   <g
19     transform="translate(0,-91)"
20     id="layer1">
21     <path
22       d="m 115.86118,194.50214 c -25.115207,21.03101 -50.230412,42.06204 -75.345617,63.09306 0,-42.06205
23       0,-84.12409 0,-126.18613 25.115205,21.03102 50.23041,42.06204 75.345617,63.09307 z"
24       id="path819"
25       hmi-bind:fill="{ {ParamProps.msgStatusSpeedLevel2? '#74b733' : '#55a0b9'} }" />
26     <path
27       id="path819-5"
28       d="m 191.20712,194.50214 c -25.1152,21.03101 -50.23041,42.06204 -75.34561,63.09306 0,-42.06205
29       0,-84.12409 0,-126.18613 25.1152,21.03103 50.23041,42.06204 75.34561,63.09307 z"
30       id="path819-5"
31       hmi-bind:fill="{ {ParamProps.msgStatusSpeedLevel2? '#74b733' : '#55a0b9'} }" />
32   </g>
33 </svg>
```

Interface with parameters

Dynamisation of the
properties

Dynamize the SVG Interface Parameter

```
<hmi:paramDef name="msgStatusSpeedLevel2" type="boolean" default="false"/>
```

Interface-parameter name
(displayed in the Symbol
properties in WinCC)
Following names are
common:

- BasicColor
- ContrastColor
 - FillLevel
- FluidColorLow
- FluidColorHigh
 - FireSize
 - Cutaway
 - Position
 - Text

The datatype of the Interface-parameter
Following datatypes are possible:

- HmiColor
- number
- boolean
- string

Default value
(used if nothing different is
connected/selected in WinCC)

Dynamize the SVG

Dynamize the property

Color depending on a boolean value:

```
hmi-bind:fill="{{ParamProps.msgStatusSpeedLevel2? '#74b733' : '#55a0b9'}}" />
```

Dynamization keyword

Keyword for interface
parameter

Value = true

Value = false

Color from HMI:

```
hmi-bind:fill="{{Converter.RGBA(ParamProps.BasicColor)}}"
```

Displaying element depending on bit in variable:

```
hmi-bind:display="{{(((ParamProps.overwrite%2^(1 + ParamProps.overwriteBit))/2^ParamProps.overwriteBit) >=1 ?  
'inline' : 'none' )}}"
```

Variable

Bit

Dynamize the SVG

Local variables

```
9      xmlns:hmi-feature="http://svg.siemens.com/hmi/feature/"
10      xmlns:hmi-event="http://svg.siemens.com/hmi/event/"
11      viewBox="0 0 125 281"
12  >
13    <hmi:self type="widget" displayName="switch" name="extended.switch" version="1.0.1" performanceClass="L">
14      <hmi:localDef name="colorLocked" type="string" hmi-bind:value="{
15        ParamProps.opStation=ParamProps.thisStation|ParamProps.opStation=' ? '#55a0b9' : '#a7bcc5' }'"/>
16      <hmi:localDef name="switchPos" type="boolean" hmi-bind:value="{((ParamProps.override%2^(1 +
17        ParamProps.overrideBit))/2^ParamProps.overrideBit)&gt;=1}"/>
18    </hmi:localDef>
19  </hmi:self>
20  <defs>
21    <hmi:localDef name="colorLocked" type="string" hmi-bind:value="{
22      ParamProps.opStation=ParamProps.thisStation|ParamProps.opStation=' ? '#55a0b9' : '#a7bcc5' }'"/>
23    <hmi:localDef name="switchPos" type="boolean" hmi-bind:value="{((ParamProps.override%2^(1 +
24      ParamProps.overrideBit))/2^ParamProps.overrideBit)&gt;=1}"/>
25  </hmi:localDef>
26  </defs>
27  <metadata
28    id="metadata5">
29  </metadata>
30  <g
31    transform="translate(0,-16)"
32    id="layer1">
33    <rect
34      ry="7.6342807"
35      rx="7.4999952"
36      y="30.904776"
37      x="22.8125"
38      height="252.4881"
39      hmi-bind:width="79.375"
40      id="rect42"
41      hmi-bind:fill="{LocalProps.colorLocked}" />
42    <circle
43      r="57.692307"
44      cy="234.5"
```

Area of local variables

Name of local variable

Keyword for dynamisation

Keyword for dynamisation

Name of local variable

Keyword for local variable

Dynamize the SVG

Possible operations

Operations

- > → >
- < → <
- /
- *
- & → und
- ==
- ? ... : ... → if

HandsOn

Prepare the interface

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HANDS ON

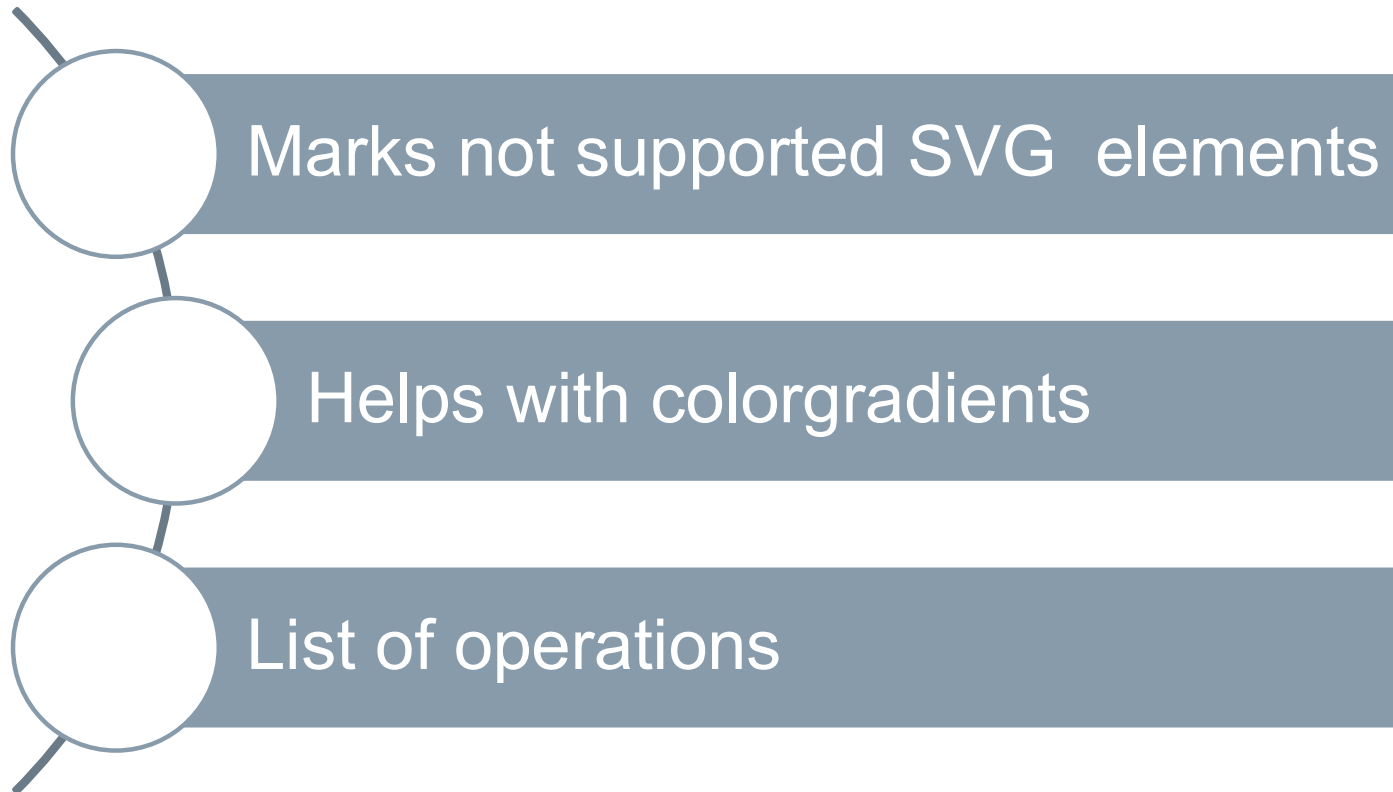
in 10 min



Prepare the interface

- Define an integer value as interface parameter
- Switch the color of the icon depending on the value
 - 0 = gray
 - 1 = orange
 - 2 = red

SVG Binding Studio



LIVE DEMO



Show SVG Binding Studio:

- Marking of not supported elements
- Showing list of operations

Restrictions

Restrictions

- Circles converted to path are not working
- After resizing path elements always „simplify“ the path
- Style properties has to be separated
- For corner radius is always both properties “rx” and “ry” needed