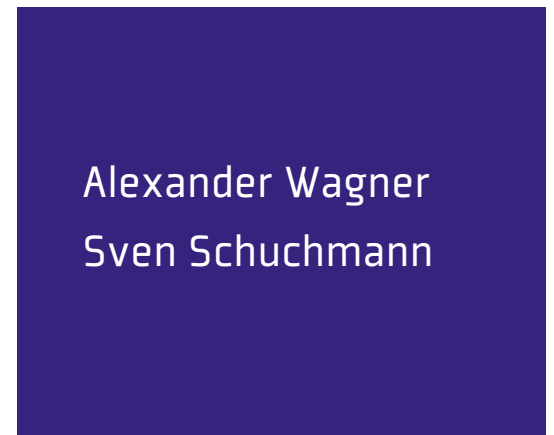
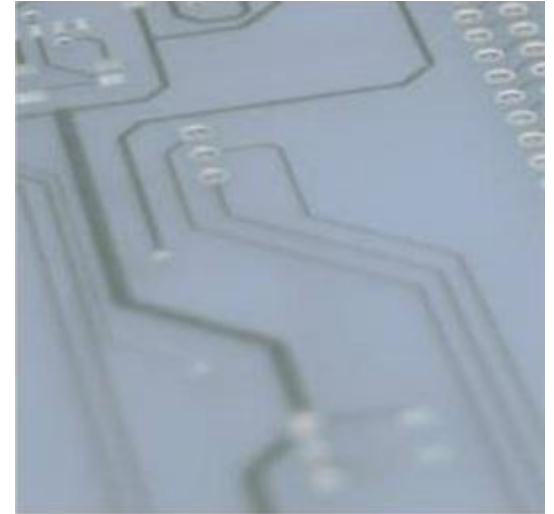
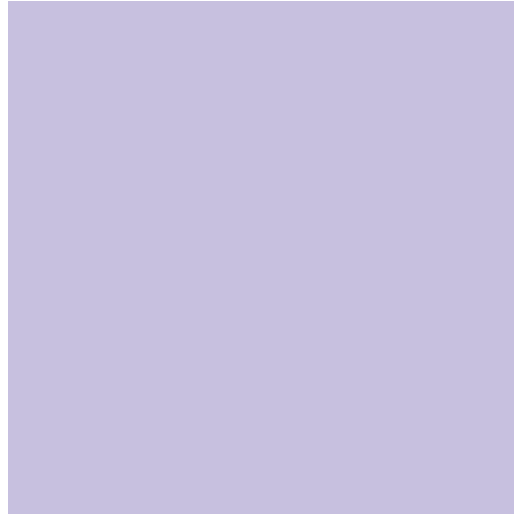
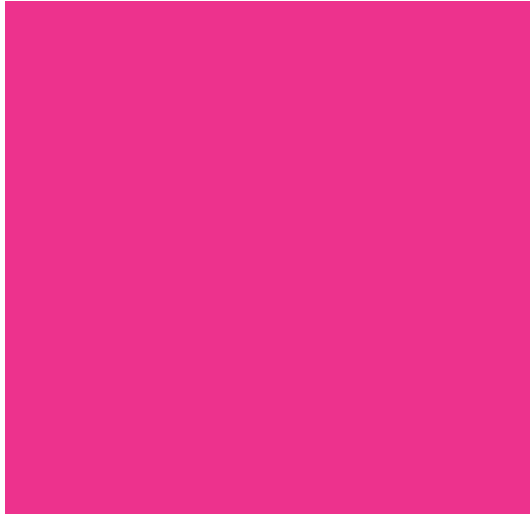


RichPanels



- Basics
 - Motivation
 - What are RichPanels
 - Functions of RichPanels
 - How to use RichPanels
- Create a RichPanel
- Create a Control

- Graphical panels look attractive!
- Common Problems of Graphical Panels
 - Fixed in their structure
 - Complex to change/adapt
 - Overloaded with several unused buttons
- With CanEasy you can create graphical panels easily with Drag&Drop for each use case

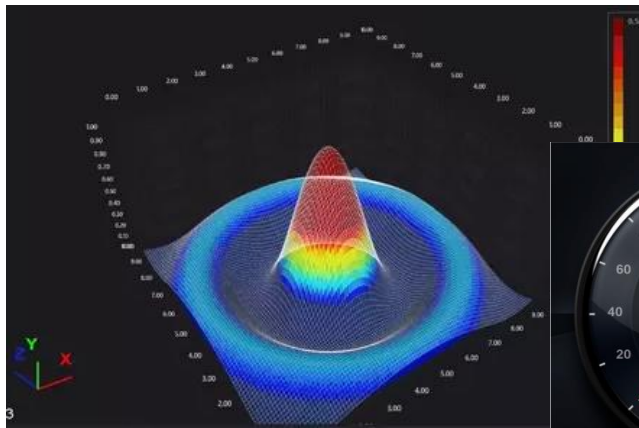
Basics – What are RichPanels?

- RichPanels are Graphical elements in CanEasy
- Usable as operating and display panel
- Each Panel consists of several controls
- RichPanels can be easy or more complex
- Controls have direct access to all attributes of the database elements



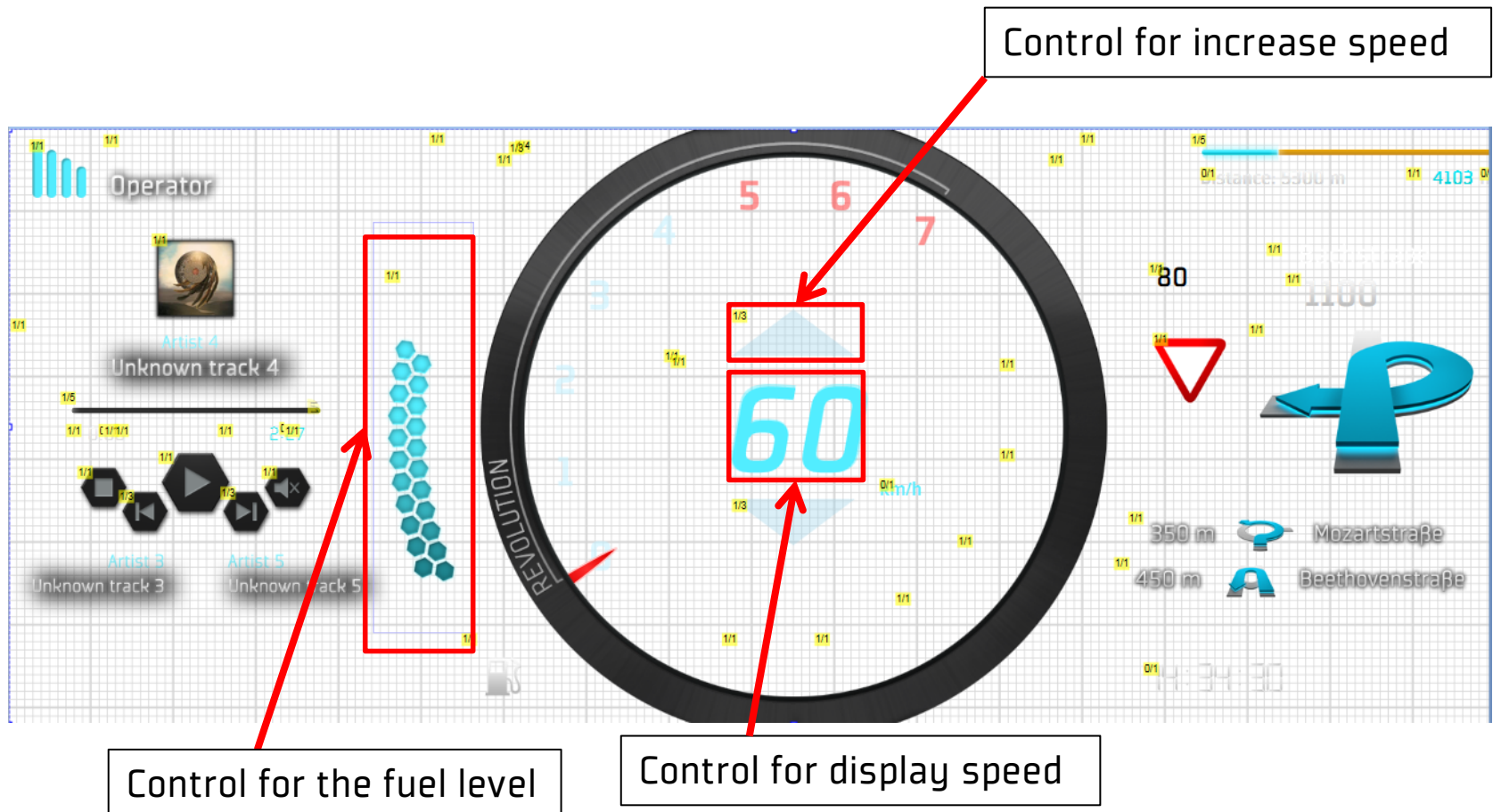
Basics – RichPanels?

- RichPanels are based on WPF
[Windows Presentation Foundation]
 - WPF is a GUI (Graphical User Interface) Framework from Microsoft
 - Used for creating applications with GUI elements
 - Provides graphic hardware acceleration



Basics – What are RichPanels?

- RichPanels can contain multiple controls



Basics – What are RichPanels?

- Add Background to look nice 😊



Basics – What are RichPanels?

- Example of RichPanel used as Controlling-Panel

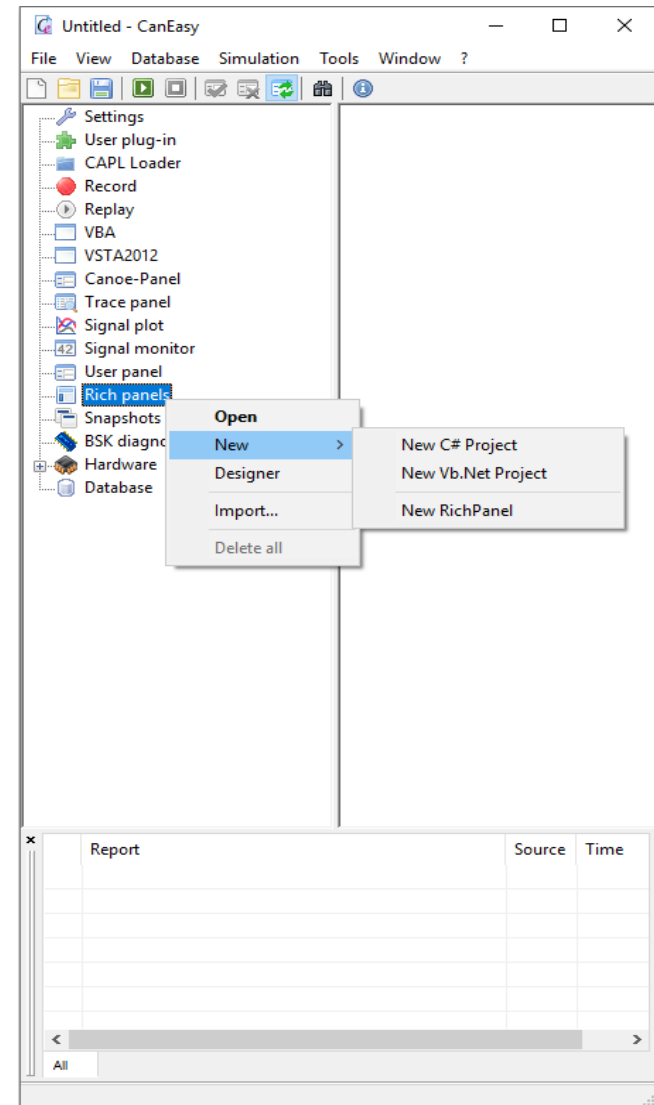


- With the integrated CanEasy PanelDesigner you can create your own RichPanels by Drag&Drop (no programming skills needed)
- Controls have access to all attributes of the database elements (Min, Max, Value, ...)
- Controls have several properties which can be connected to the database elements (color, size, ...)

- RichPanels can be exported and imported to be used in different workspaces.
- RichPanels can be changed inside the exported file format “.spd” (JSON script language)
- Advanced:
Controls can be created with .NET Framework

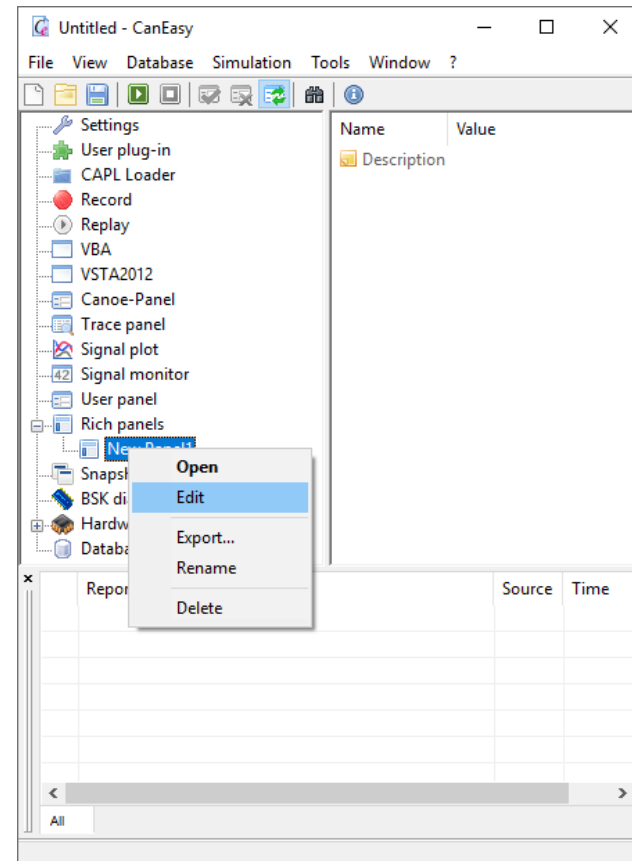
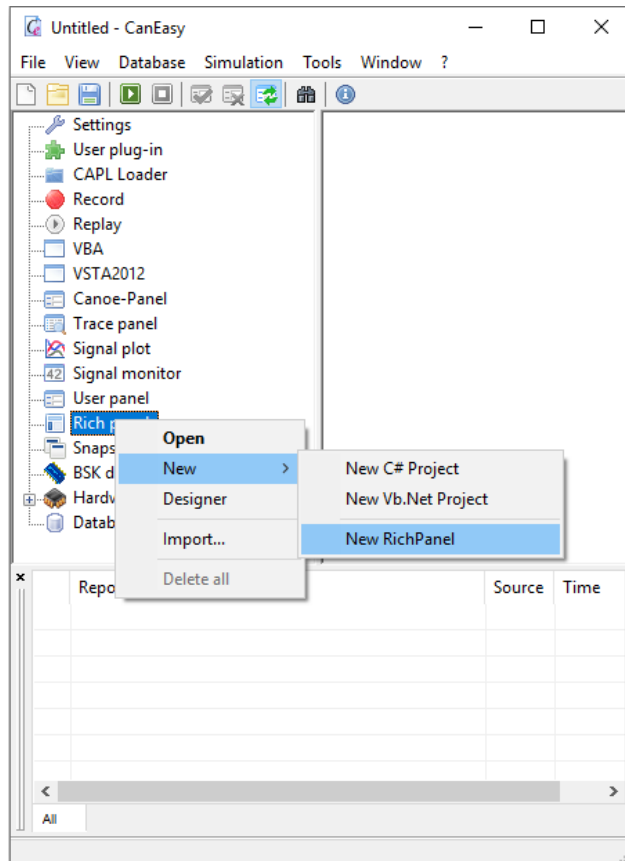
Basics – RichPanels getting started

- Open
 - Open panel overview
- New
 - Create empty C# Project
 - Create empty Vb.Net Project
 - Create empty RichPanel
- Designer
 - Open the PanelDesigner
- Import
 - Import Panel or Canoe file
- Delete All
 - Delete all panels



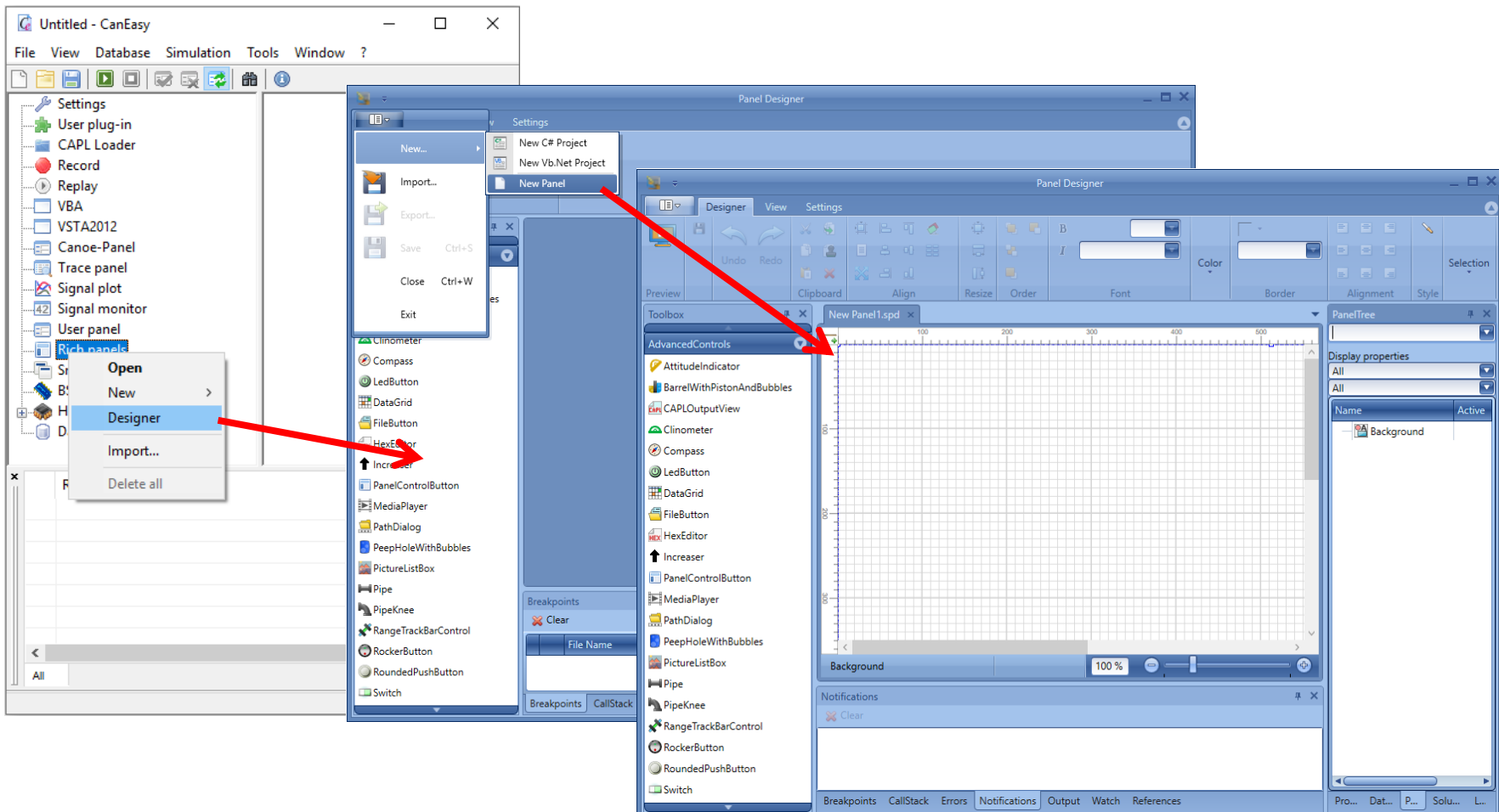
Basics – RichPanel starting

- Create a new empty panel
- Edit Panel in PanelDesigner



Basics – Overview design panel

- Open PanelDesigner
- Create New Panel



Basics – Overview design panel

The screenshot shows the 'Panel Designer' window. The top menu bar includes 'Designer', 'View', and 'Settings'. Below it is a toolbar with icons for undo, redo, and other design actions. On the left is a 'Toolbox' with categories like 'AdvancedControls', 'Basic', 'Car3dControl', 'Gauges', 'Indicators', and 'RichControls'. The main area is a grid for designing the panel. On the right is a 'PanelTree' showing the hierarchy of the design, currently showing 'Background'. At the bottom are several tabs: 'Breakpoints', 'CallStack', 'Errors', 'Notifications', 'Output', 'Watch', 'References', 'Property Grid', 'Data Explorer', 'PanelTree', 'Solution Explorer', and 'Layers'. Red boxes and arrows highlight specific areas: one box around the top menu and toolbar with an arrow pointing to a list of settings; another box around the toolbox with an arrow pointing to a text box about controls; a third box around the main design grid with an arrow pointing to a text box about the panel; and two boxes at the bottom with arrows pointing to lists of available views.

Settings of:

- Designer
- Handle of panels (save, import,...)
- View
- Settings

Several Controls available (sorted by Groups)

Panel to Design

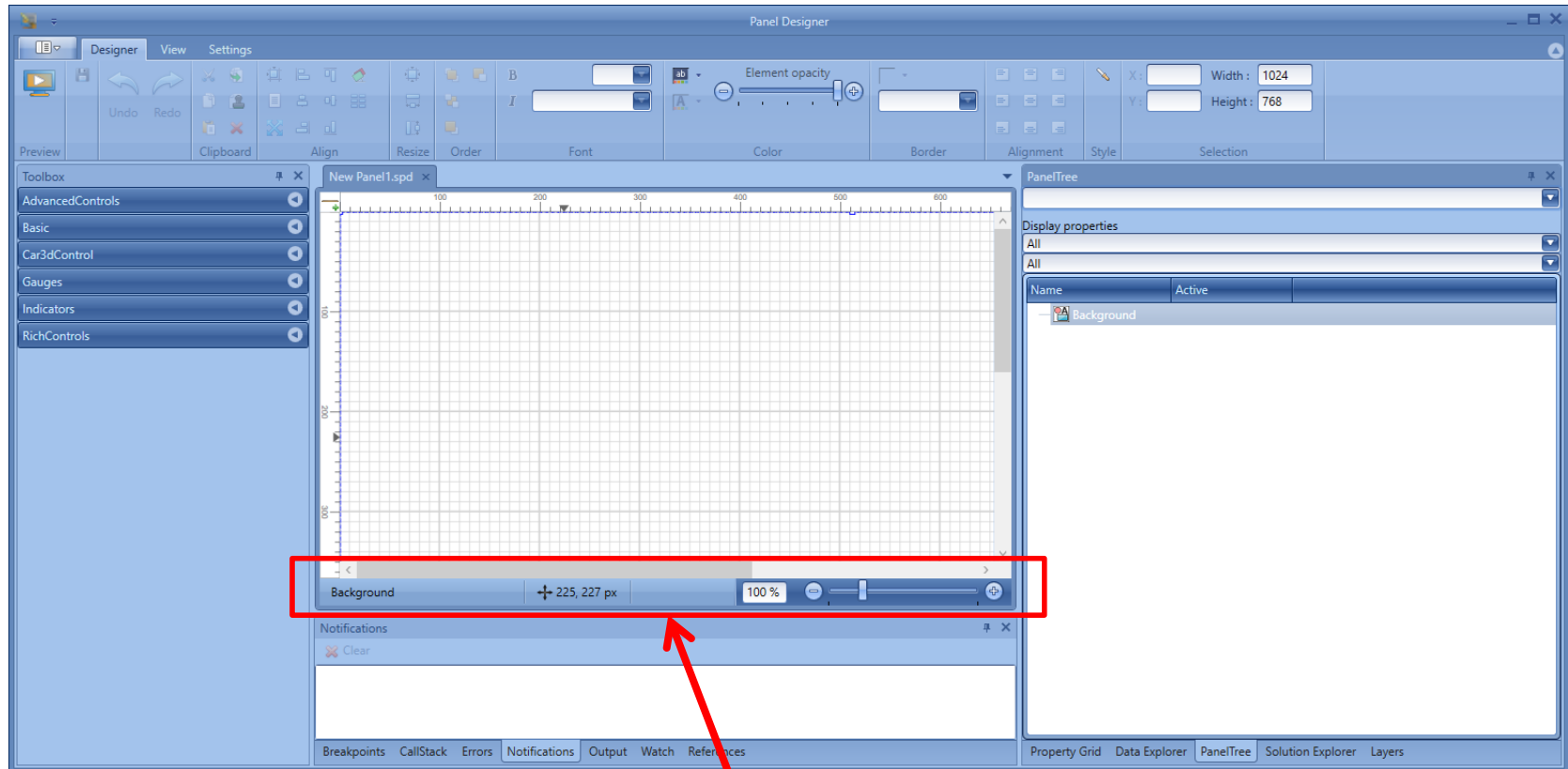
Several views for:

- Breakpoints
- CallStack
- Errors
- Notifications
- Output
- Watch
- Reference

Several views for:

- Property Grid
- Data Explorer
- Panel Tree
- Panel Explorer
- Layers

Basics – Overview design panel



- Name of current active control
- current position of mouse pointer
- scale of panel (can be changed from 40% to 300%)

Basics – Overview design panel

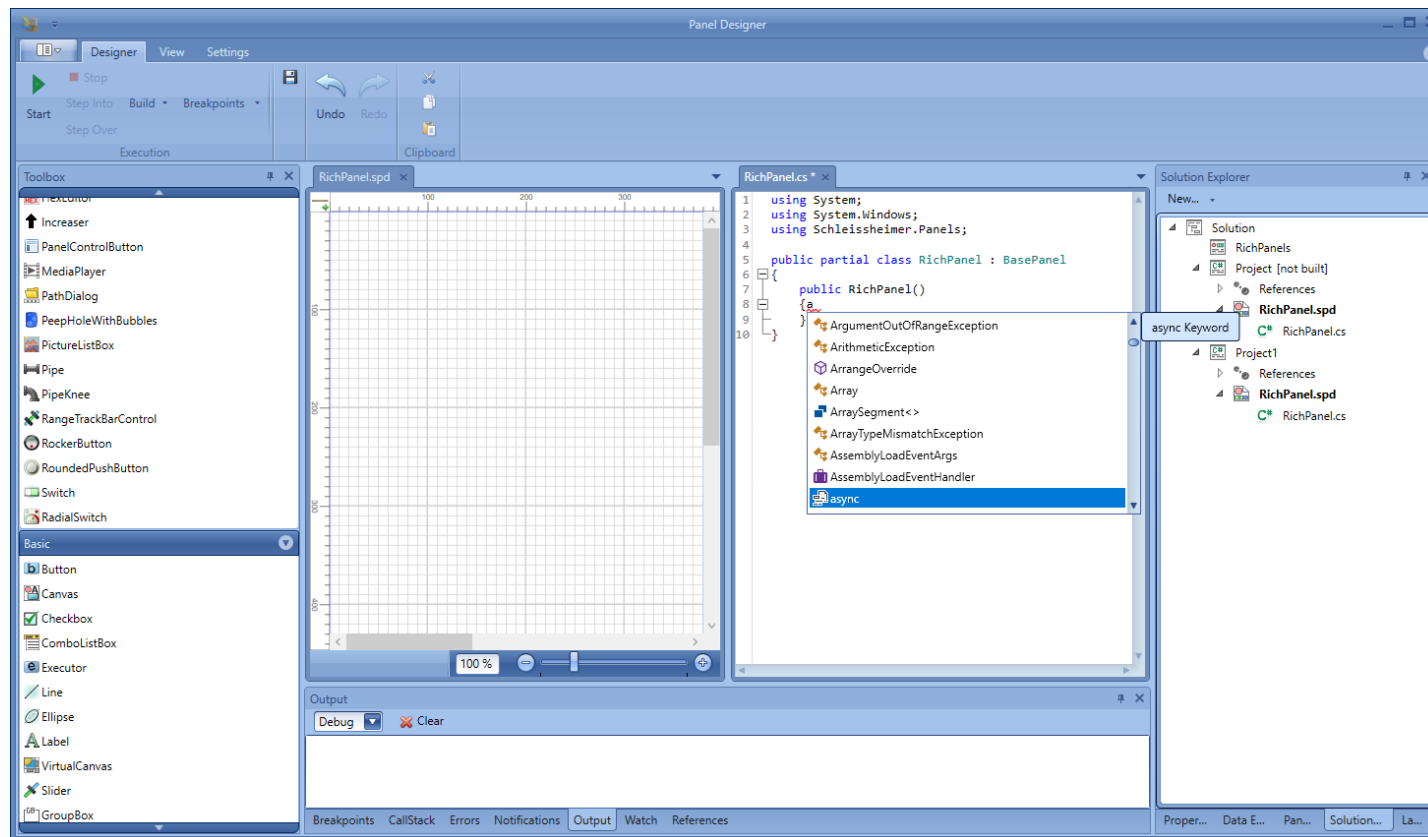
■ Create New C# / Vb.Net Project

The image illustrates the process of creating a new C# or Vb.Net project in a software development environment. It is divided into three main sections:

- Top Left:** A tree view on the left shows a project structure with items like "Signal monitor", "User panel", "Rich panel", "Snapshots", "BSK diagram", "Hardware", and "Database". A context menu is open over the "Rich panel" item, with the "New" option selected. This opens a sub-menu with three options: "New C# Project", "New Vb.Net Project", and "New RichPanel". A red arrow points from this sub-menu towards the main application window.
- Top Right:** A separate window titled "Designer" is shown. It has tabs for "Designer", "View", and "Settings". Below the tabs are three buttons: "New Panel", "New C# Project", and "New Vb.Net Project". A red arrow points from the "New C# Project" button in this window towards the main application window.
- Bottom:** The main application window, titled "Panel Designer", is shown in a full view. It features a "Toolbox" on the left with various UI controls like "AttitudeIndicator", "BarrelWithPistonAndBubbles", "CAPLOutputView", "Clinometer", "Compass", "LedButton", "DataGrid", "FileButton", "HexEditor", "Increase", "PanelControlButton", "MediaPlayer", "PathDialog", "PeepHoleWithBubbles", "PictureListBox", "Pipe", "PipeKnee", "RangeTrackBarControl", "RockerButton", "RoundedPushButton", and "Switch". The central area is a grid labeled "Panel to Design". To the right of the grid is a "Code Editor" window showing C# code for a "RichPanel" class. The code includes using statements for "System", "System.Windows", and "Schleissheimer.Panels", and a partial class definition for "RichPanel" that inherits from "BasePanel". The "RichPanel" class has a constructor "RichPanel()". The "Solution Explorer" on the far right shows the project structure, including "RichPanels" and "Project1 [not built]". The bottom status bar includes tabs for "Breakpoints", "CallStack", "Errors", "Notifications", "Output", "Watch", and "References".

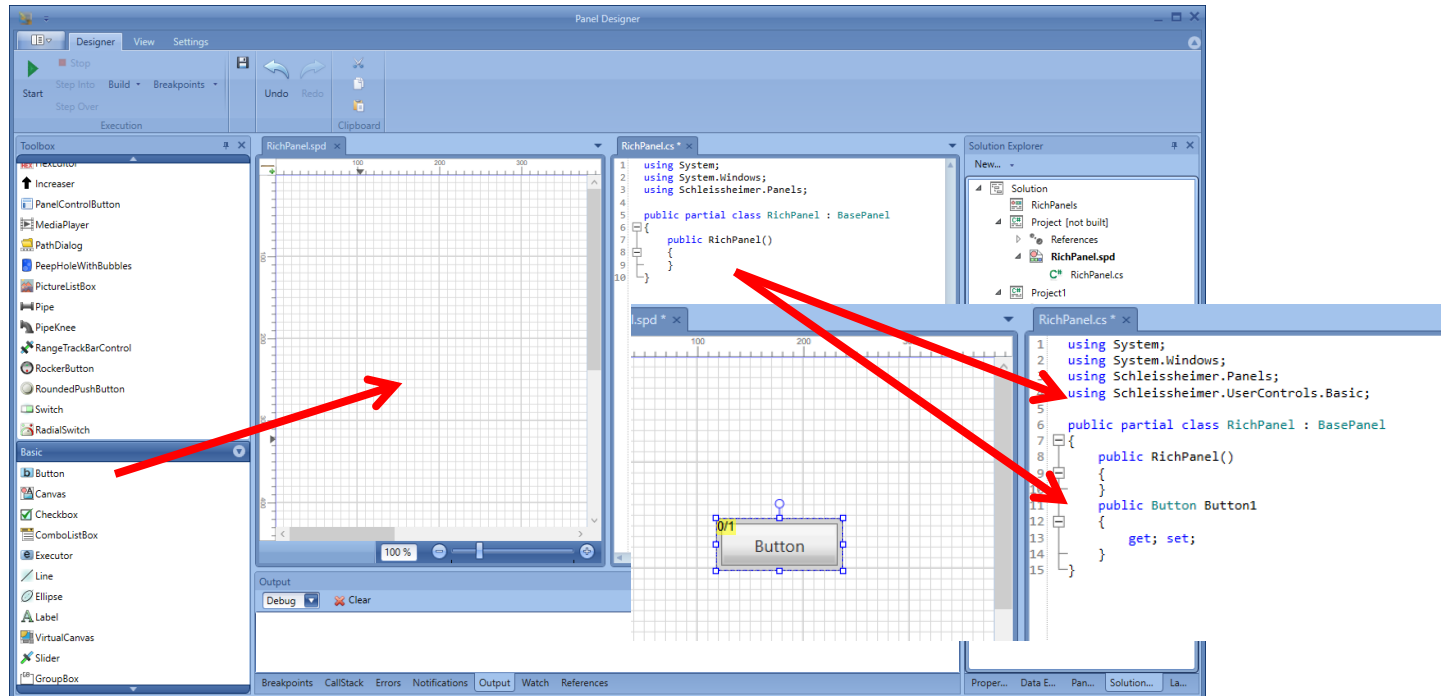
Basics – Overview design panel

- In the code editor, you can open the * .cs and * .vb format files.
- IntelliSense is allowed



Basics – Overview design panel

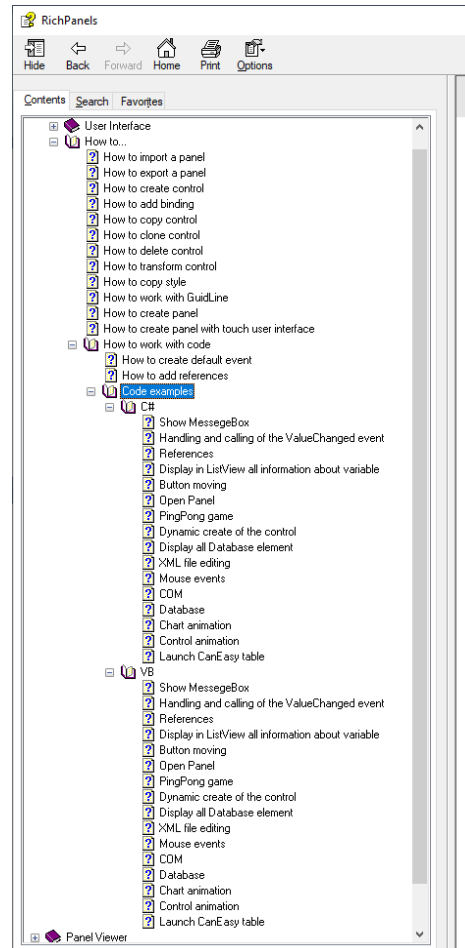
- After adding controls in visual editor code has been automatically updated



- You can write some code himself

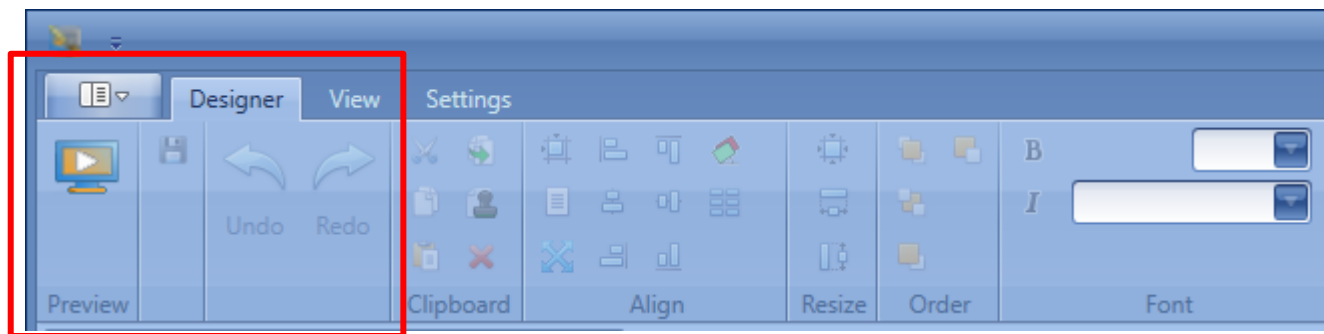
Basics – Overview design panel

- Also some code examples can be found on Help



Basics – Designer tab

- For Visual and Code editors ribbon has different views
- View for visual editor:

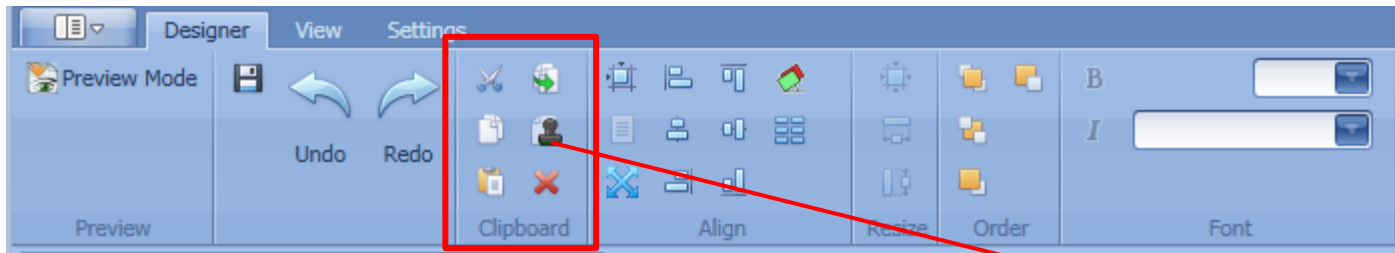


Undo/Redo changes







Save current panel

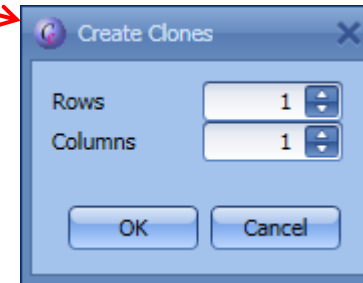
Preview current panel

Basics – Designer tab

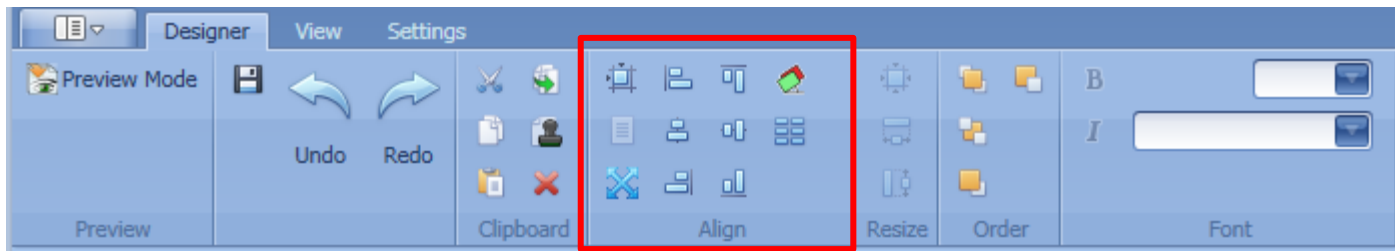


■ Group Clipboard












- Cut 
 - Cuts the selected control or group of controls
- Copy 
 - Copies the selected control or group of controls
- Paste 
 - Inserts the selected control or group of controls
- Duplicate 
 - Duplicate the selected control or group of controls
- Clone 
 - Creates multiple duplicates...
- Delete 
 - Removes the selected control or group of controls



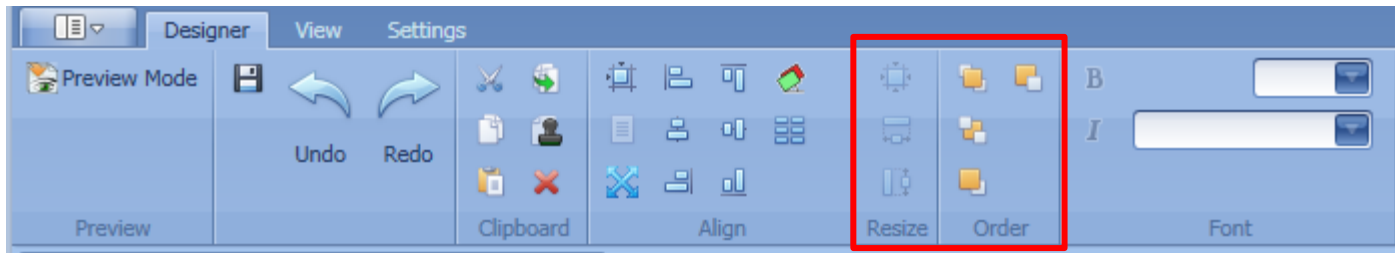
Basics – Designer tab






■ Group Align

- Align to grid 
 - Aligns the selected control or group of controls to the grid
- Align to text 
 - Aligns a group of controls to the text of the first selected control
- Adjust by controls 
 - Clips the background along the boundaries of the selected controls
- Align Left, Center, Right 
 - Aligns a group of controls to the left, center, right border of the first selected control
- Align Top, Middle, Bottom 
 - Aligns a group of controls to the top, middle, bottom border of the first selected control
- Set same angle 
 - Sets the rotation angle of first selected control to the group of controls
- Table layout 
 - Arranges the selected controls to the table





Basics – Designer tab



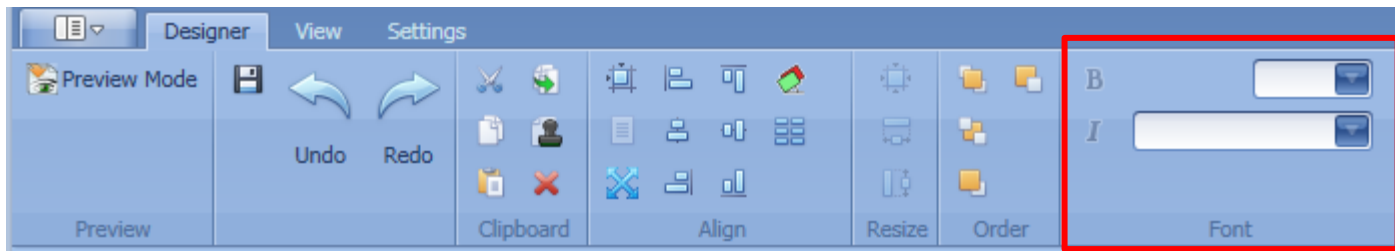
■ Group Resize

- Size to Grid 
 - Sets the size of the control to the nearest boundaries of the grid
- Same Width 
 - Assigns the width of the group of controls the same width as the first selected control
- Same Height 
 - Assigns the height of the group of controls the same width as the first selected control

■ Group Order

- Bring to Front 
 - Moves the selected control to the front
- Send to Back 
 - Moves the selected control to the back
- Bring Forward 
 - Moves the selected control to the layer above
- Send Backward 
 - Moves the selected control to the layer below

Basics – Designer tab



■ Group Front

– Bold

- Makes bold the text of the selected control

– Italic

- Makes italic the text of the selected control

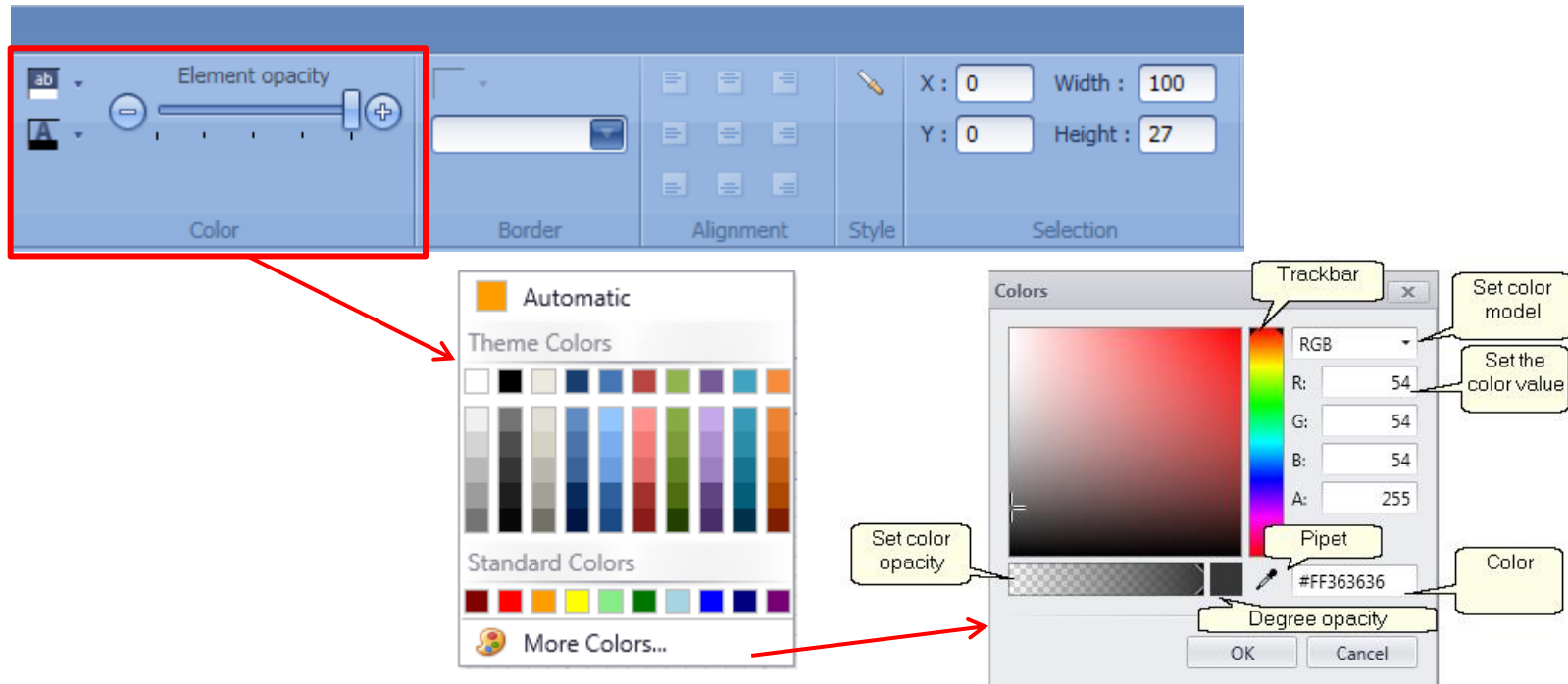
– Font size

- The size of the text in the selected control can be changed using the drop-down list of font size

– Font style

- The font style of the selected controls can be changed using the drop-down list font family

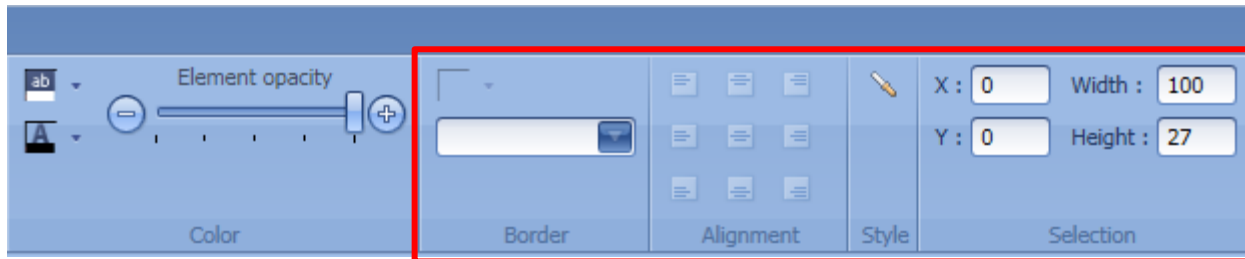
Basics – Designer tab



■ Color

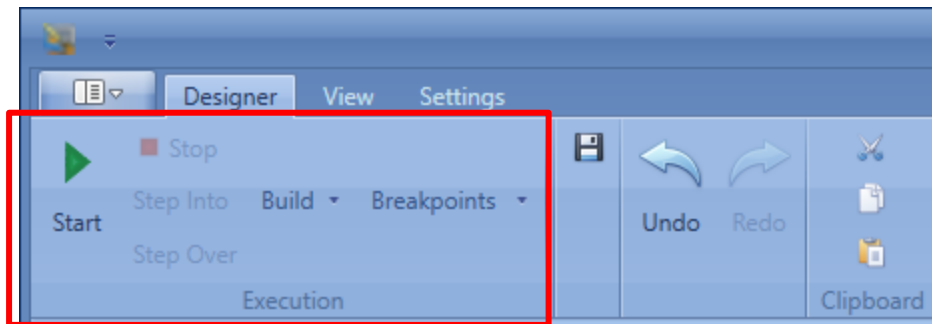
- Background
 - Opens the color editor to changes background color of the selected control
- Foreground
 - Opens the color editor to changes the color of the text of the selected control
- Element opacity
 - Set the opacity of the selected controls

Basics – Designer tab

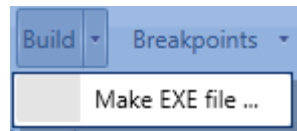


- **Border**
 - Border color
 - Opens the color editor to changes the border color of the selected controls
 - Border thickness
 - Set border thickness
- **Alignment**
 - Top-, middle-, bottom-Left
 - Sets text alignment in selected control to top, middle, bottom left alignment
 - Top-, middle-, bottom-Center
 - Sets text alignment in selected control to top, middle, bottom center alignment
 - Top-, middle-, bottom-Right
 - Sets text alignment in selected control to top, middle, bottom right alignment
- **Style**
 - Pipet
 - Copies the style from one control to another
- **Selection**
 - Displays the X,Y, Width and Height of the group of selected controls. Within this attributes the sizes could be changed

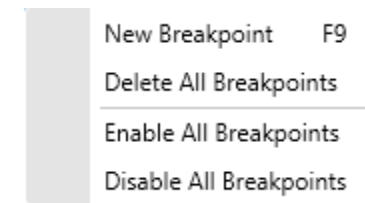
■ Ribbon for code editor



Build project and create .exe file



Work with Breakpoints

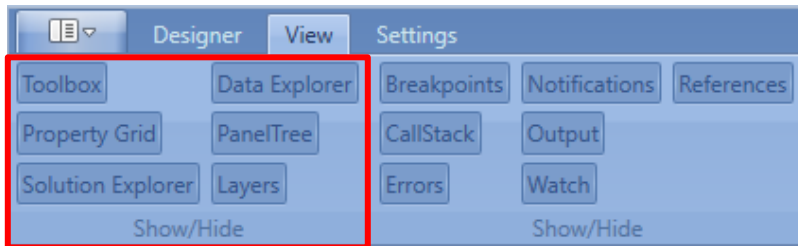


Run or stop running project

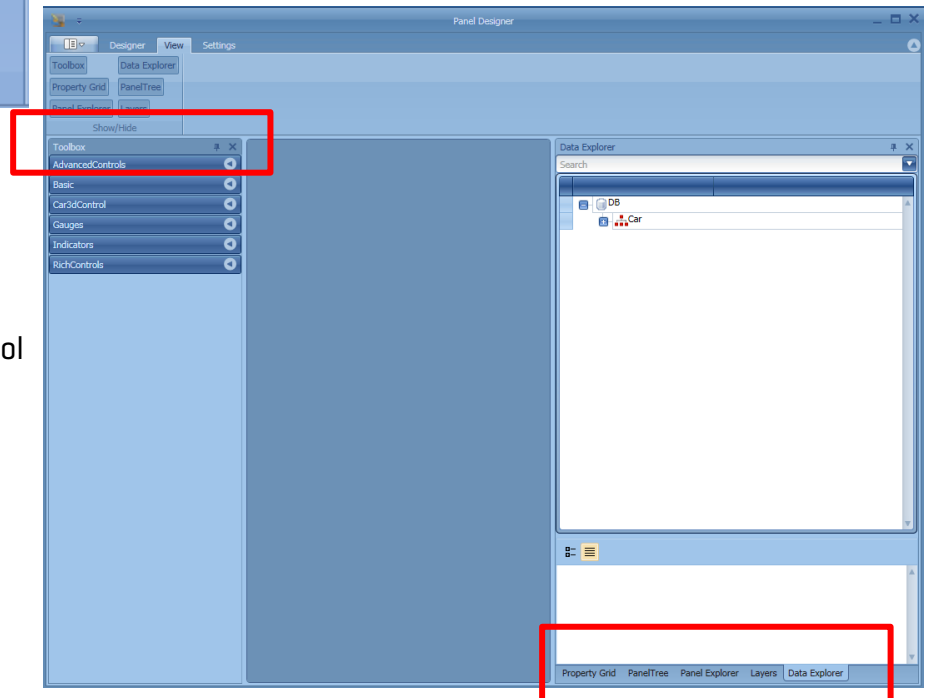
Video guide



Basics – View tab

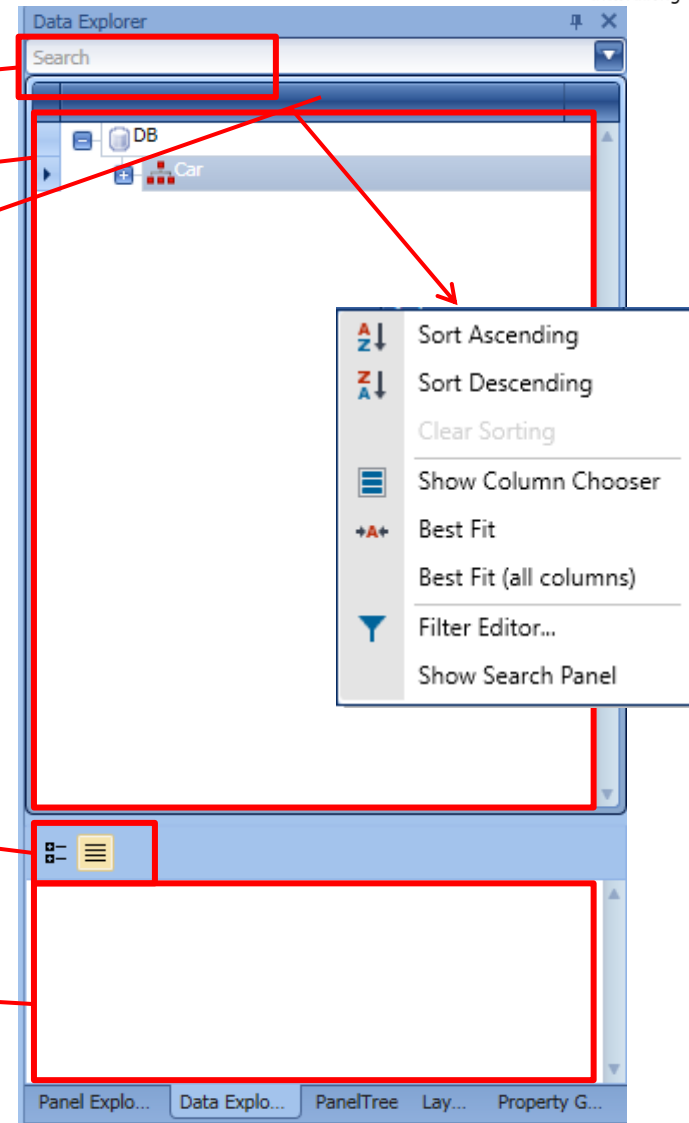


- **Toolbox**
 - Contain the controls, sorted by groups
- **Property grid**
 - Contain the properties of the active control
- **Panel explorer**
 - View about all created RichPanels
- **Data explorer**
 - Contain the database
- **PanelTree**
 - View over the used controls within the current open RichPanel
- **Layers**
 - View about all layers inside the RichPanel



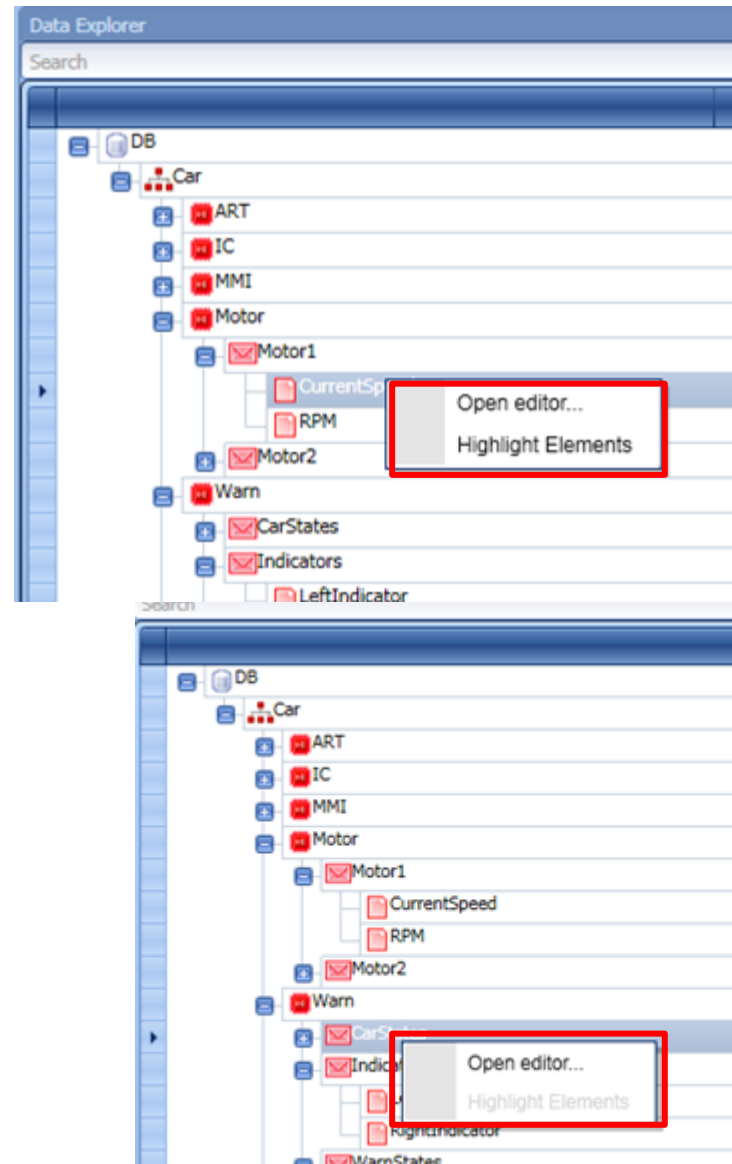
Basics – Data Explorer

- Search window
- Database content
- Right-click on Name/Active open a context menu for e.g. create filter options
- Database element content sorted by group or list
- Database element content



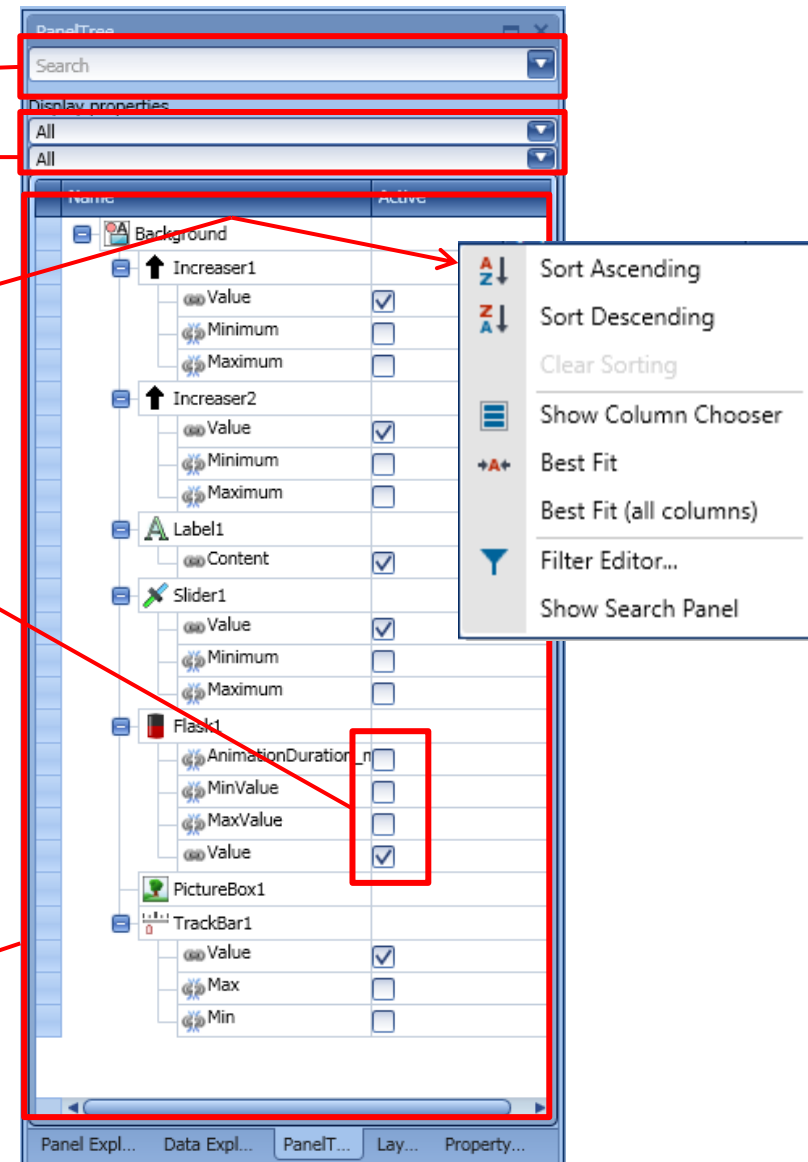
Basics – Data Explorer

- For the database elements a context menu can be opened, by right-click on the element
 - Open editor to adapt the element attributes
 - Highlight the control which are bind with this element (only available if a bind to a control exist)



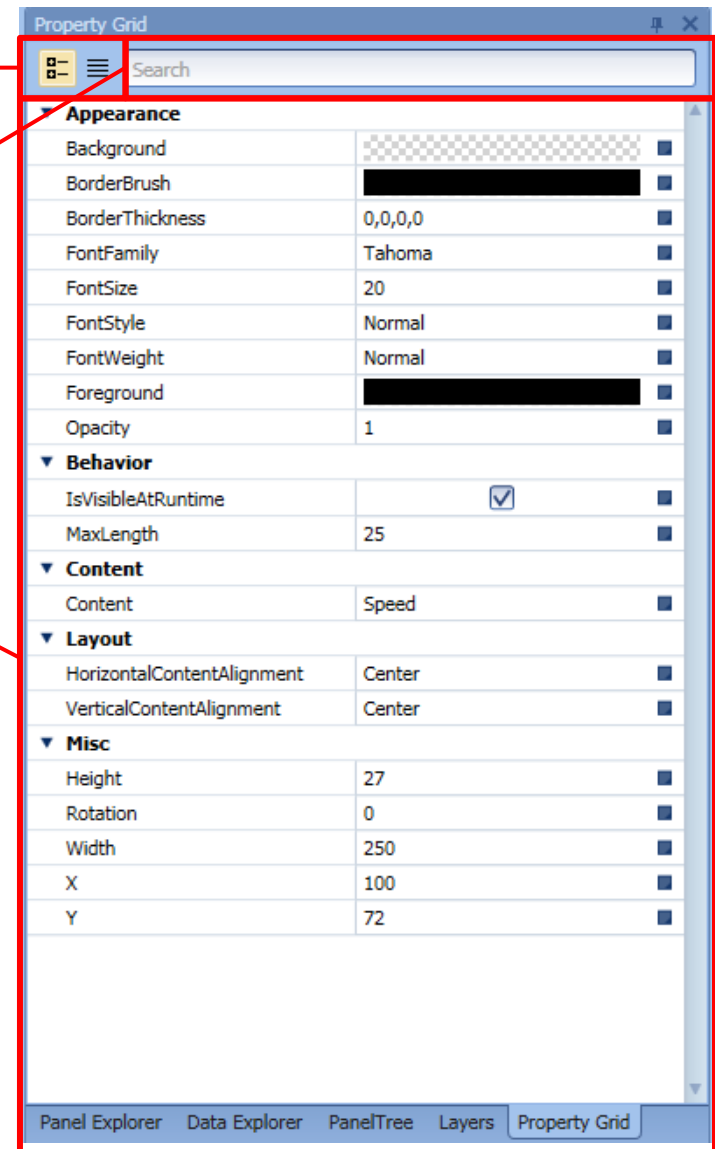
Basics – PanelTree

- Search window
- Filter for the controls, e.g. inactive, active
- Right-click on Name/Active, opens a context menu, for e.g. sorting, create filter
- Every control has several attributes which can be set to activated/deactivated. If this attributes are set to active, then this can be bind to the database elements
- All controls from current RichPanel



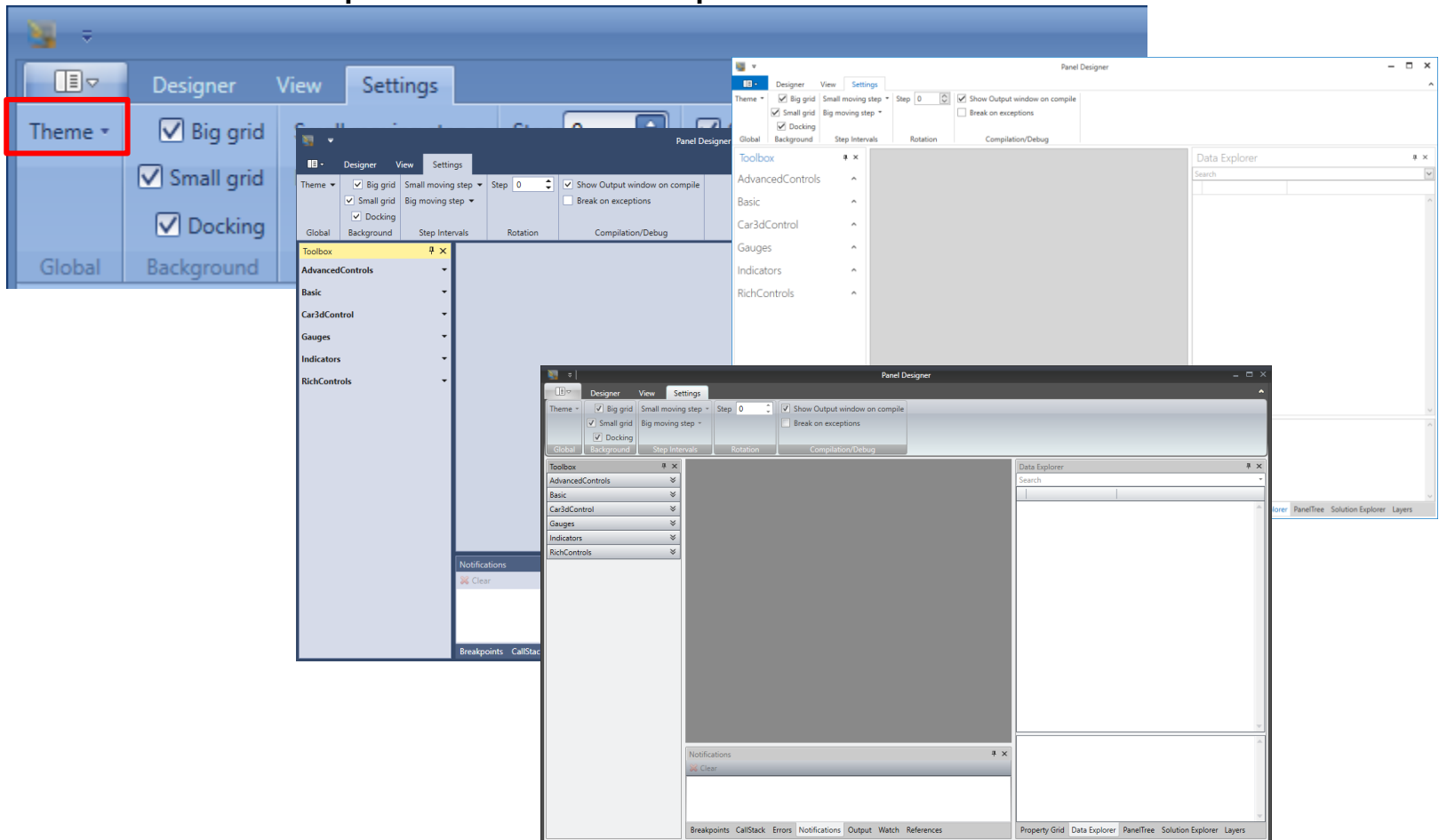
Basics – Property Grid

- Properties of control sorted by group or in list view
- Search window
- All properties of control



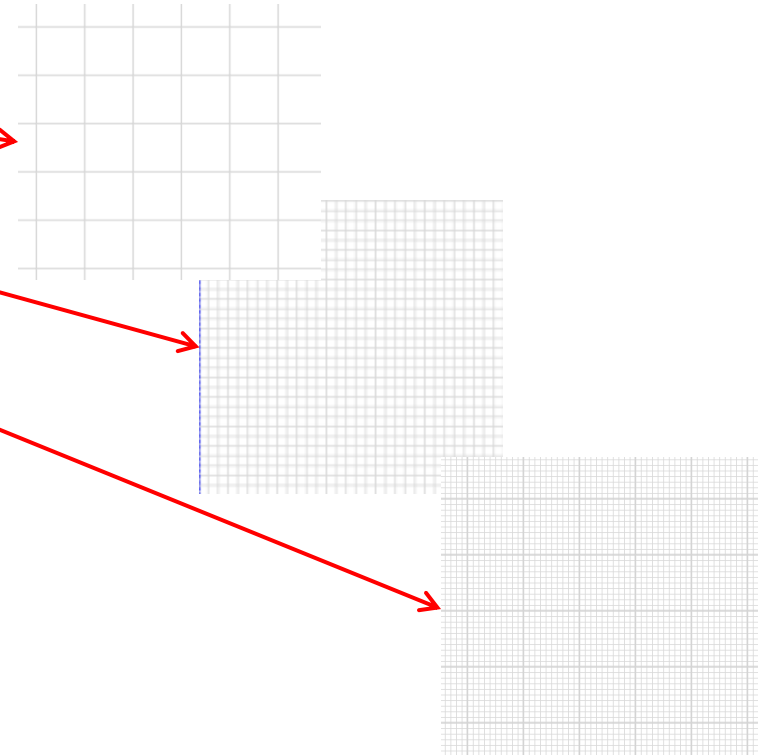
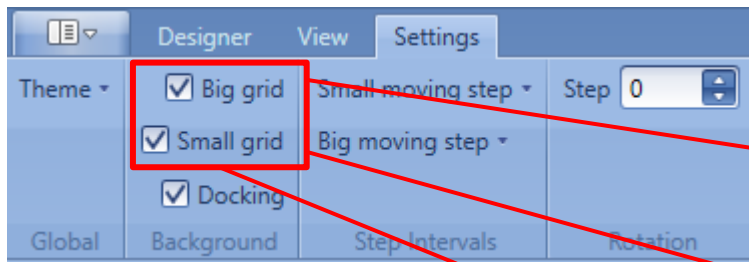
Basics – Settings

- Theme
 - Several options for view part



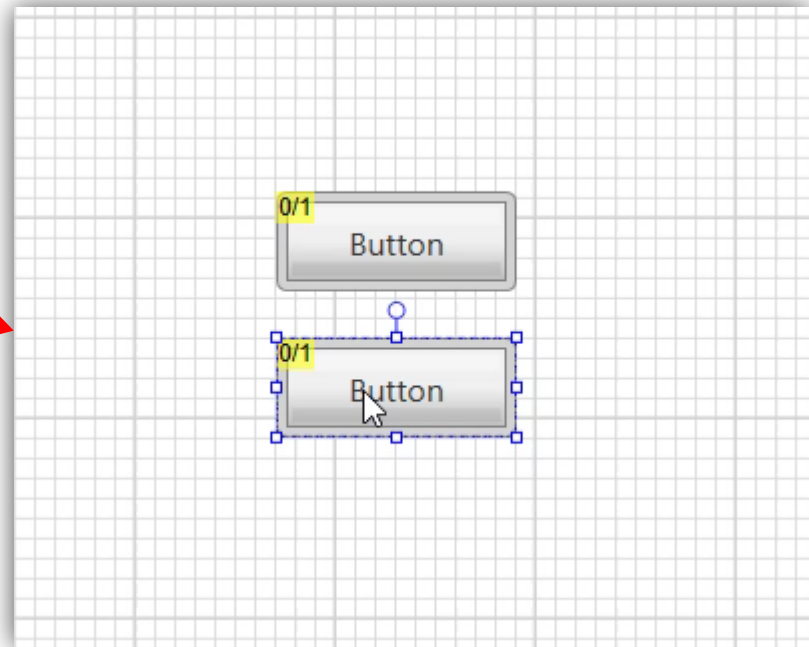
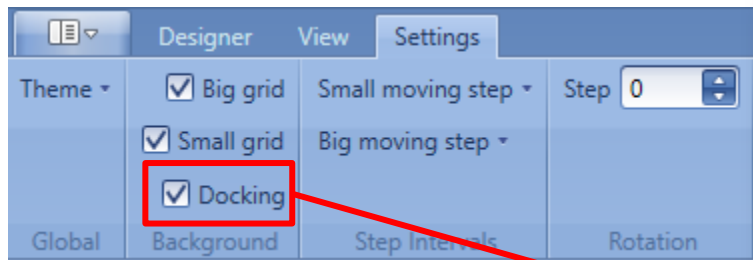
Basics – Settings

- Background
 - Options to set up the grids inside the design panel



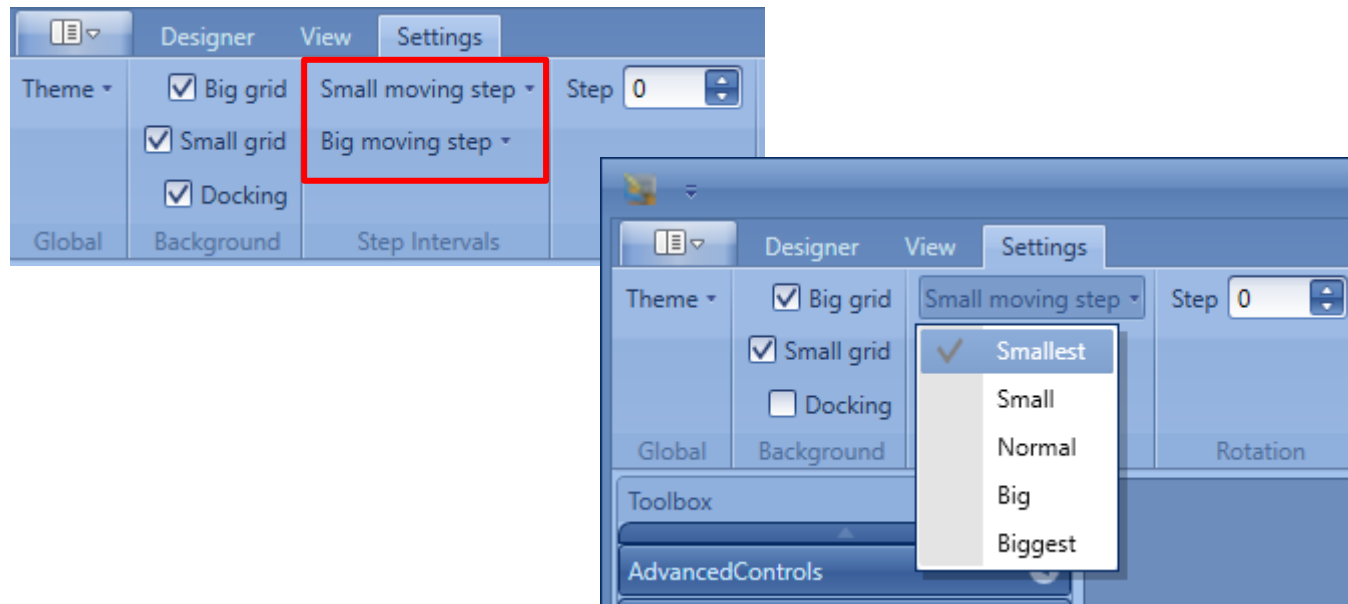
Basics – Settings

- Docking
 - Elements on the panel will be automatically docked



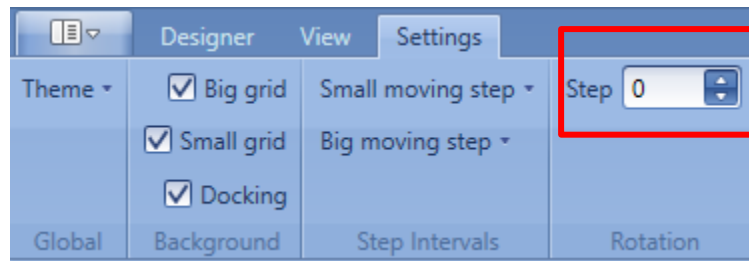
Basics – Settings

- Moving steps
 - Small moving steps (Moving control by arrows on keyboard)
 - Big moving steps (Moving controls by arrows + “CTRL” on keyboard)



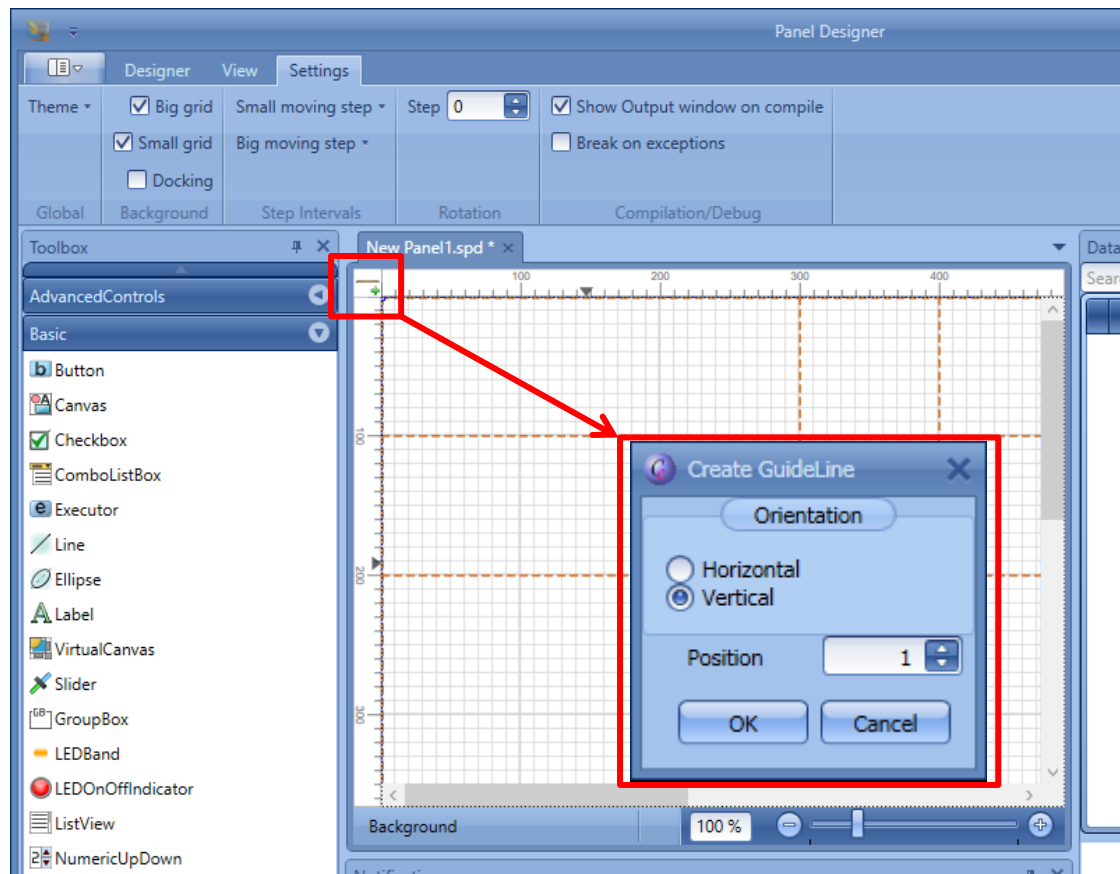
Basics – Settings

- Step
 - Set up angle of rotation
 - Hold “CTRL” and rotate the control with the mouse in the entered step



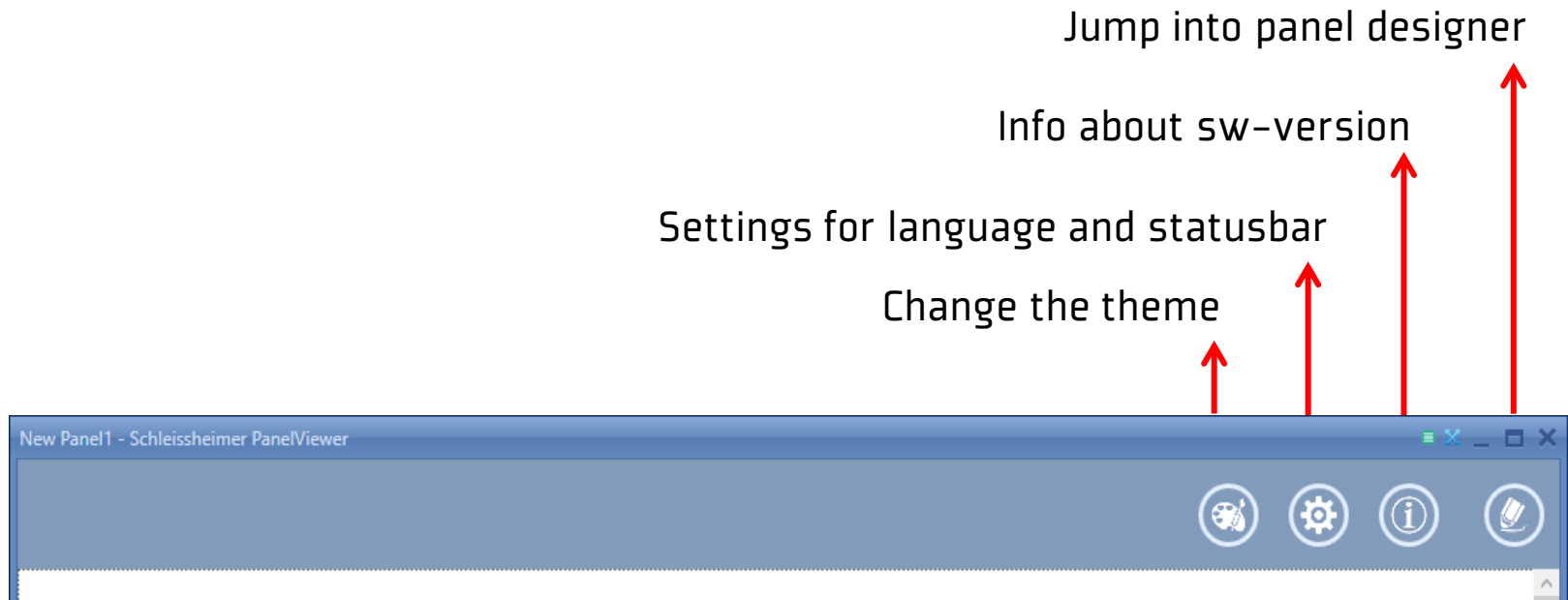
Basics – GuideLines

- Inside design panel several guide lines can be set up for e.g. placing the controls




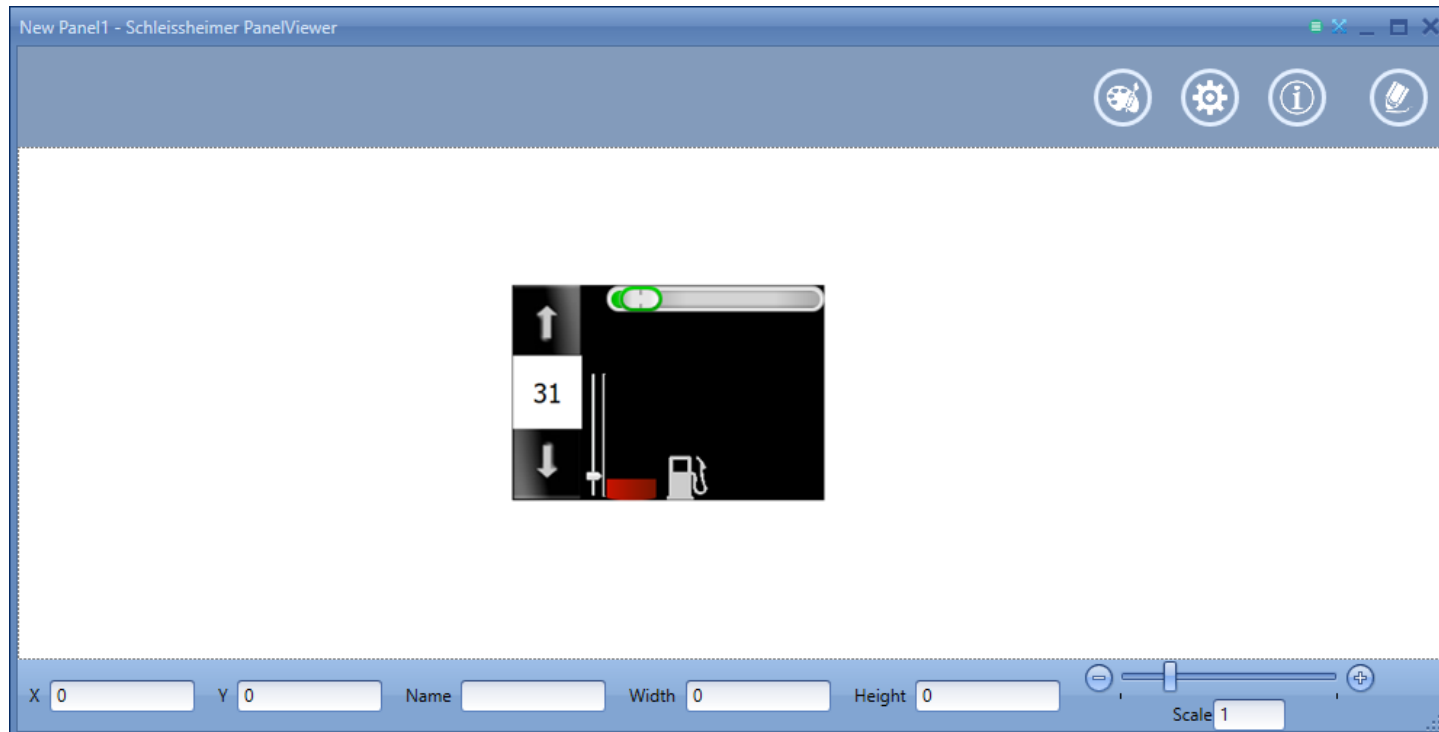
Basics – RichPanel Overview

- Inside a RichPanel, a right mouse click open a taskbar on the upper side with the following options

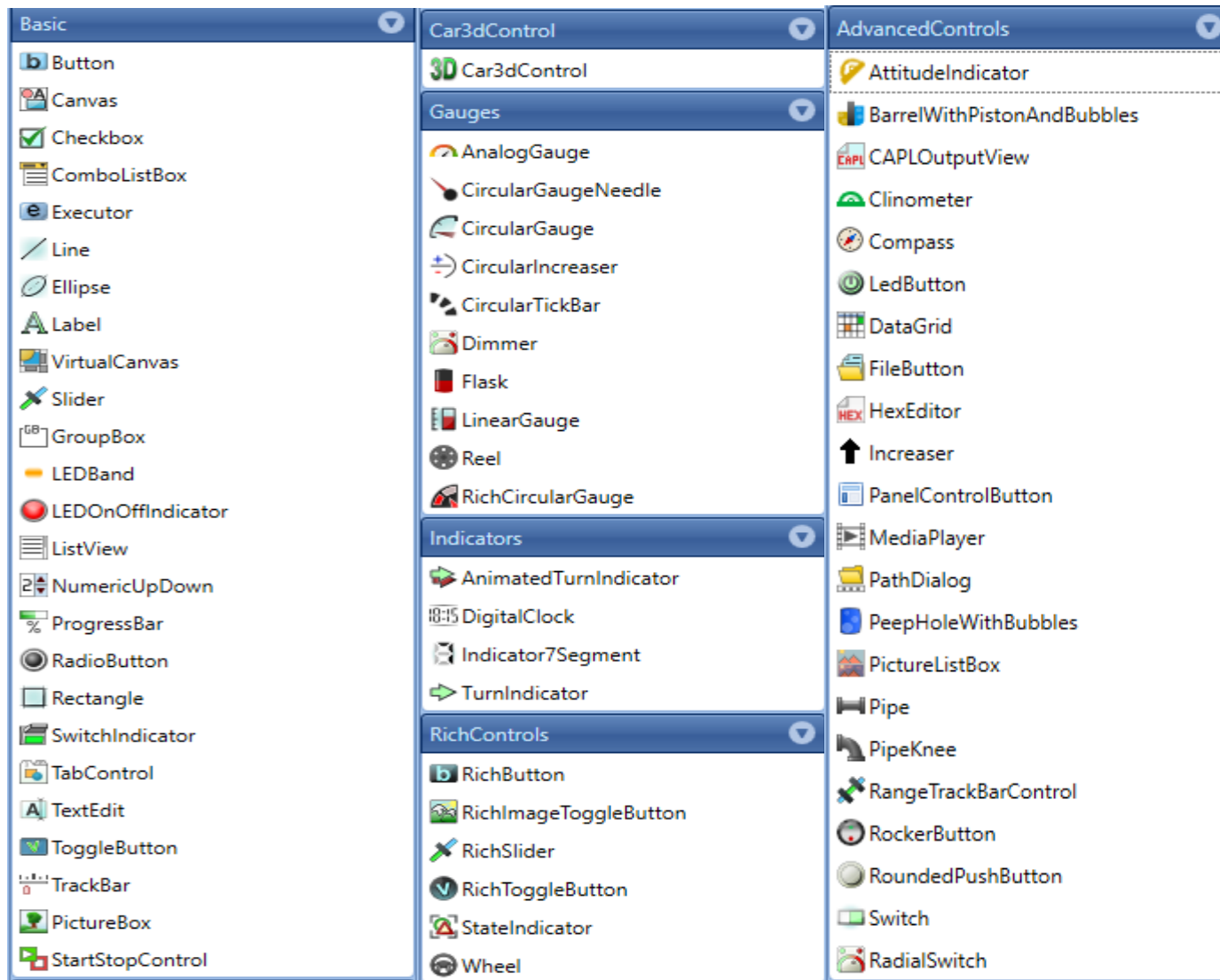


Basics – RichPanel Overview

- Inside a RichPanel additionally following options are possible
 - Zooming inside the RichPanel (CTRL + mouse wheel)
 - A statusbar shows the current positions of mouse cursor, name of control, width and height and scale
 - The size of the RichPanel can be set to optimum by using 



Basics – Available controls

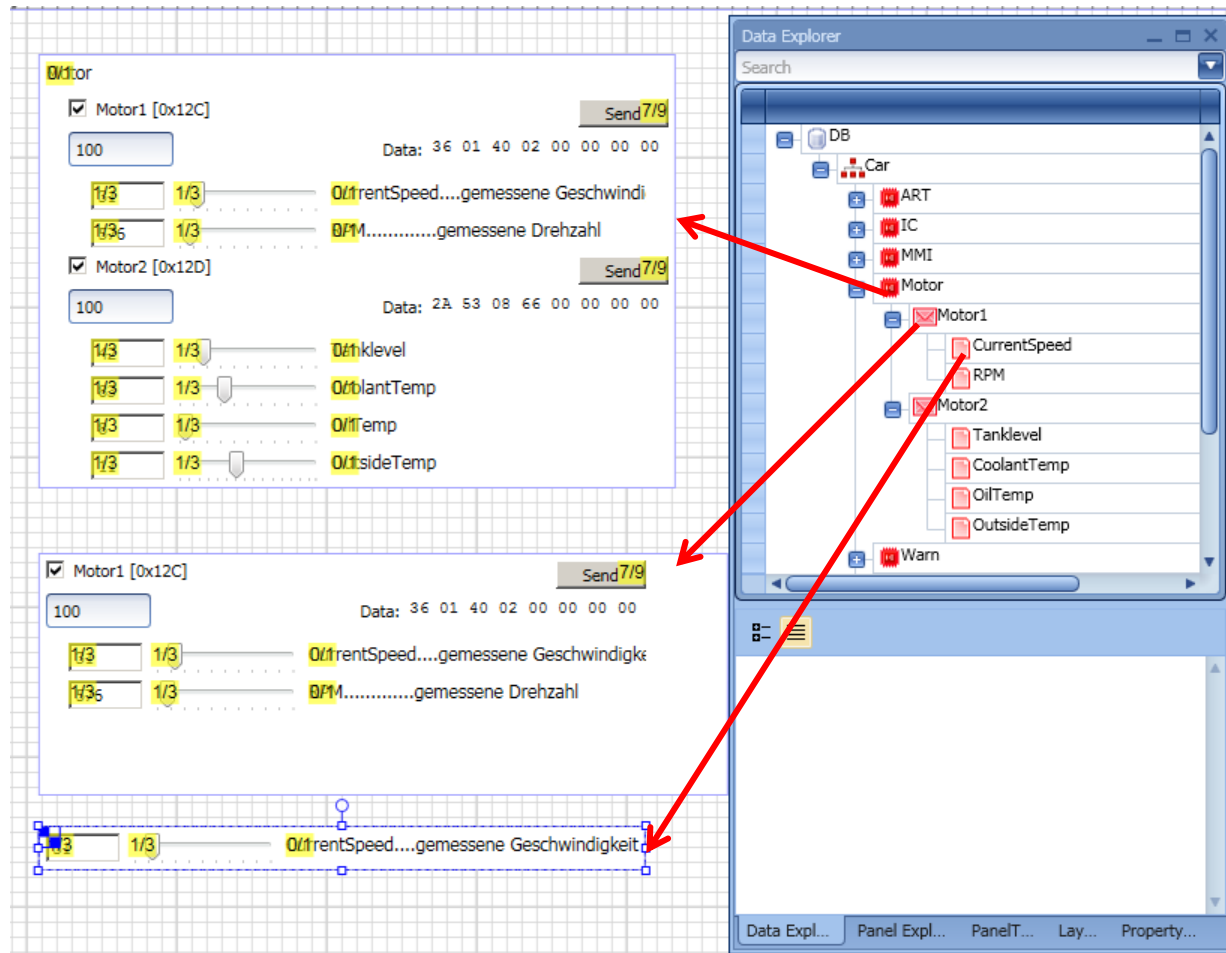


Basics – Usage of database

- All database elements can be used by controls
- Controls can be bound to each attribute of the database element
- A default RichPanel can be easily created by drag the element (ECU, Message or Signal) onto the RichPanel

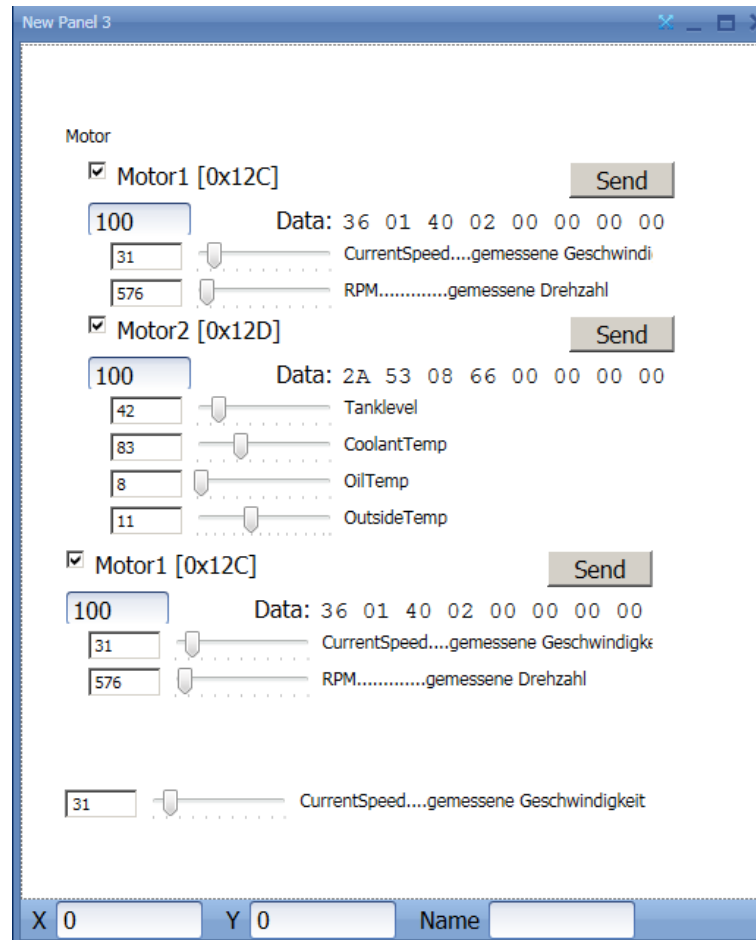
Basics – Usage of database

- Default RichPanels can be easily created by drag the element onto the design panel



Basics – Usage of database

- Result will be the RichPanel created as seen below



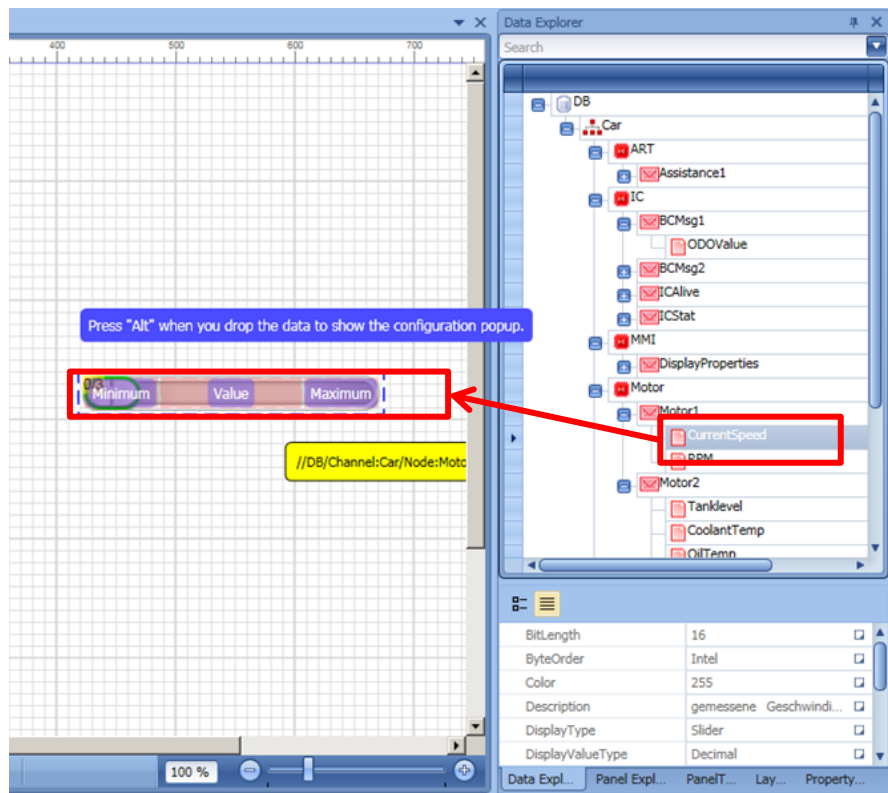
The screenshot shows a software window titled "New Panel 3" containing a RichPanel with the following elements:

- Motor Section:**
 - ☒ **Motor1 [0x12C]** Send
 - Value: 100, Data: 36 01 40 02 00 00 00 00
 - 31 CurrentSpeed....gemessene Geschwindi
 - 576 RPM.....gemessene Drehzahl
 - ☒ **Motor2 [0x12D]** Send
 - Value: 100, Data: 2A 53 08 66 00 00 00 00
 - 42 Tanklevel
 - 83 CoolantTemp
 - 8 OilTemp
 - 11 OutsideTemp
 - ☒ **Motor1 [0x12C]** Send
 - Value: 100, Data: 36 01 40 02 00 00 00 00
 - 31 CurrentSpeed....gemessene Geschwindigke
 - 576 RPM.....gemessene Drehzahl
- Bottom Section:**
 - 31 CurrentSpeed....gemessene Geschwindigkeit
- Footer:** X 0 Y 0 Name

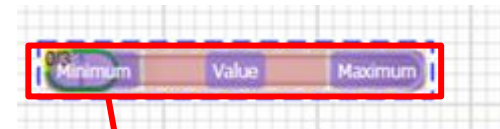
Basics – Usage of database

- Assign of database element to control
 - Drag the element to the control [1], then the attributes of the control will be pop-up, to which this element can be bind [2]

[1]



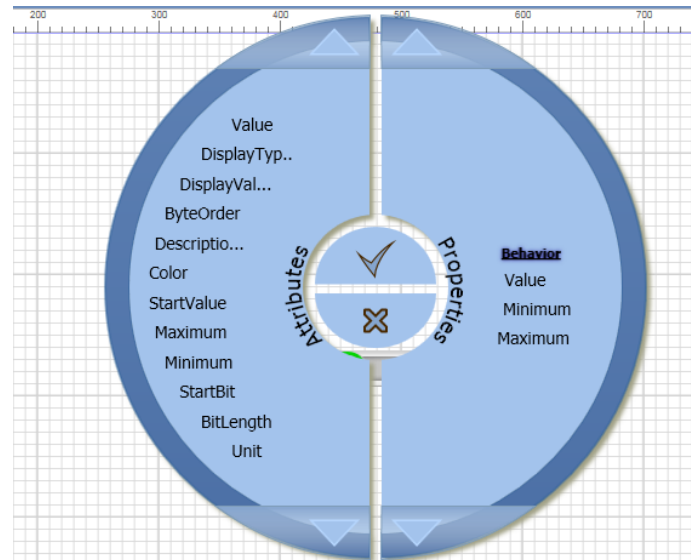
[2]



Shows the attributes of the control to which the element can be bind

Basics – Pie-Menu

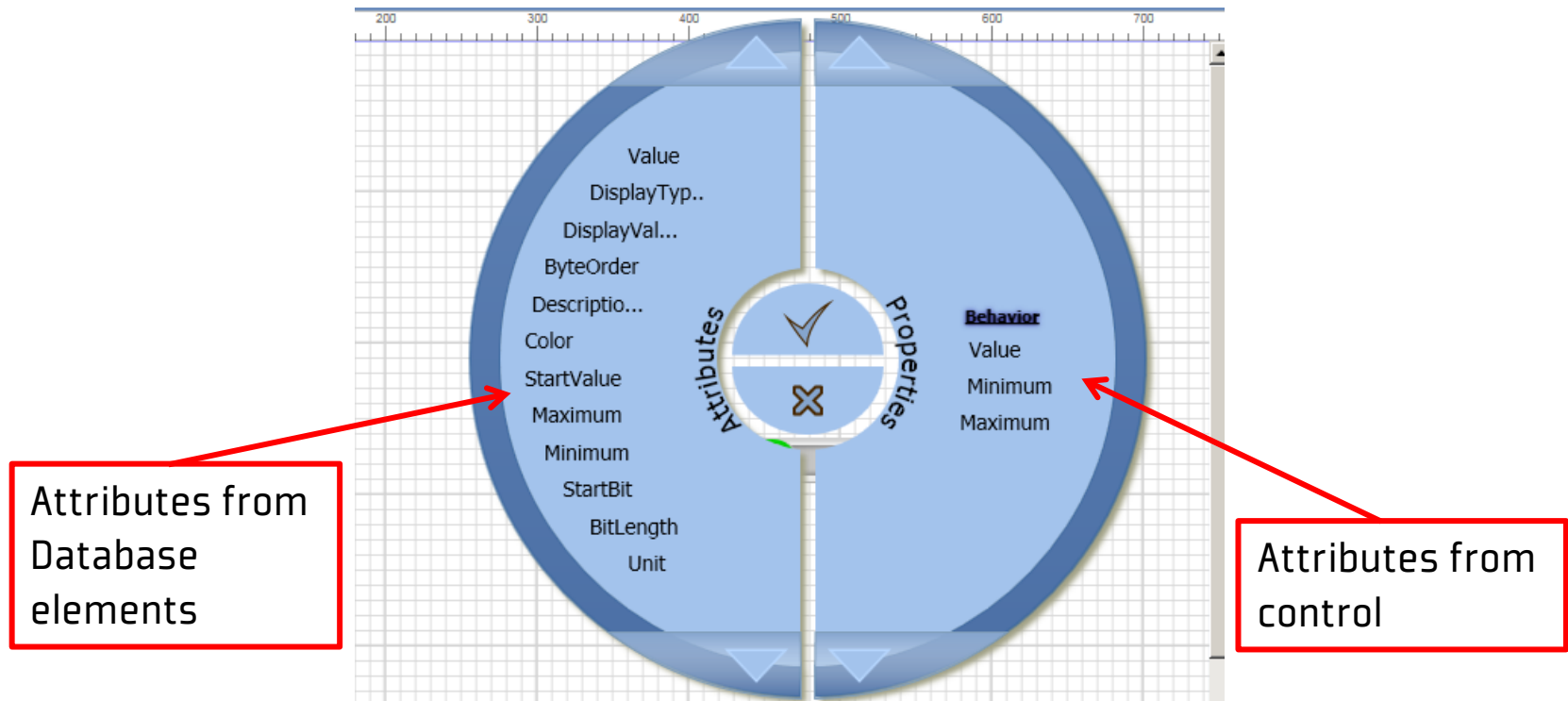
- Assign a special attribute (Min, Max, ...) from a database element to a control
 - Drag a database element to the control
 - Hold and press “Alt” and then release the mouse-press and a context menu will be opened (Configuration Pop-up)
 - OR
 - Drag the element onto the control without selecting a property





Configuration pop-up
[Pie-Menu]

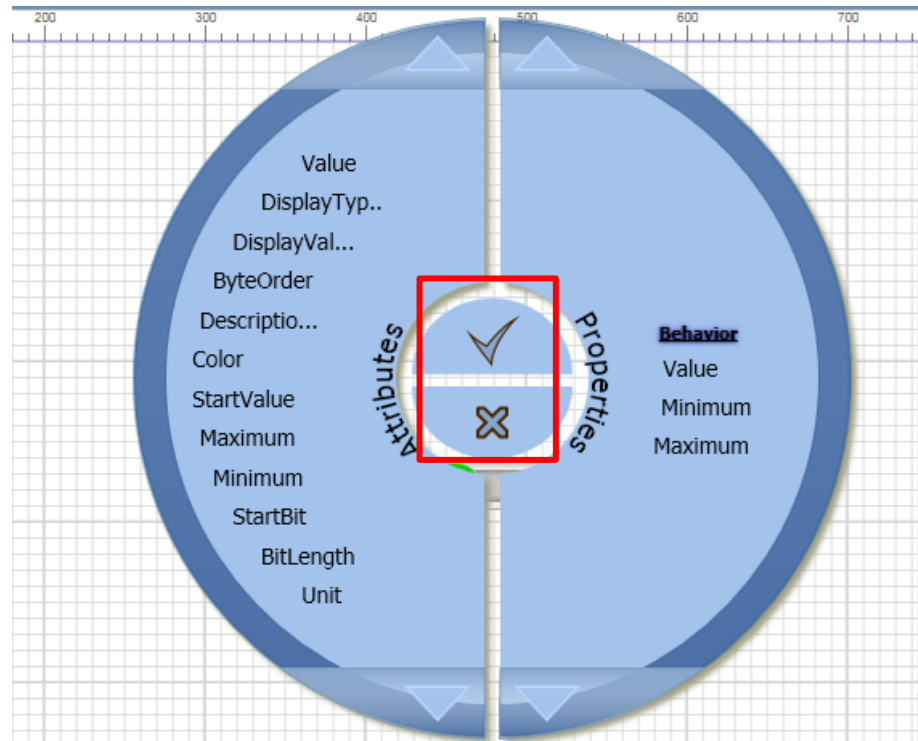
Basics – Usage of database

- Left side
 - Attributes of the element from database
- Right side
 - Attributes of the control



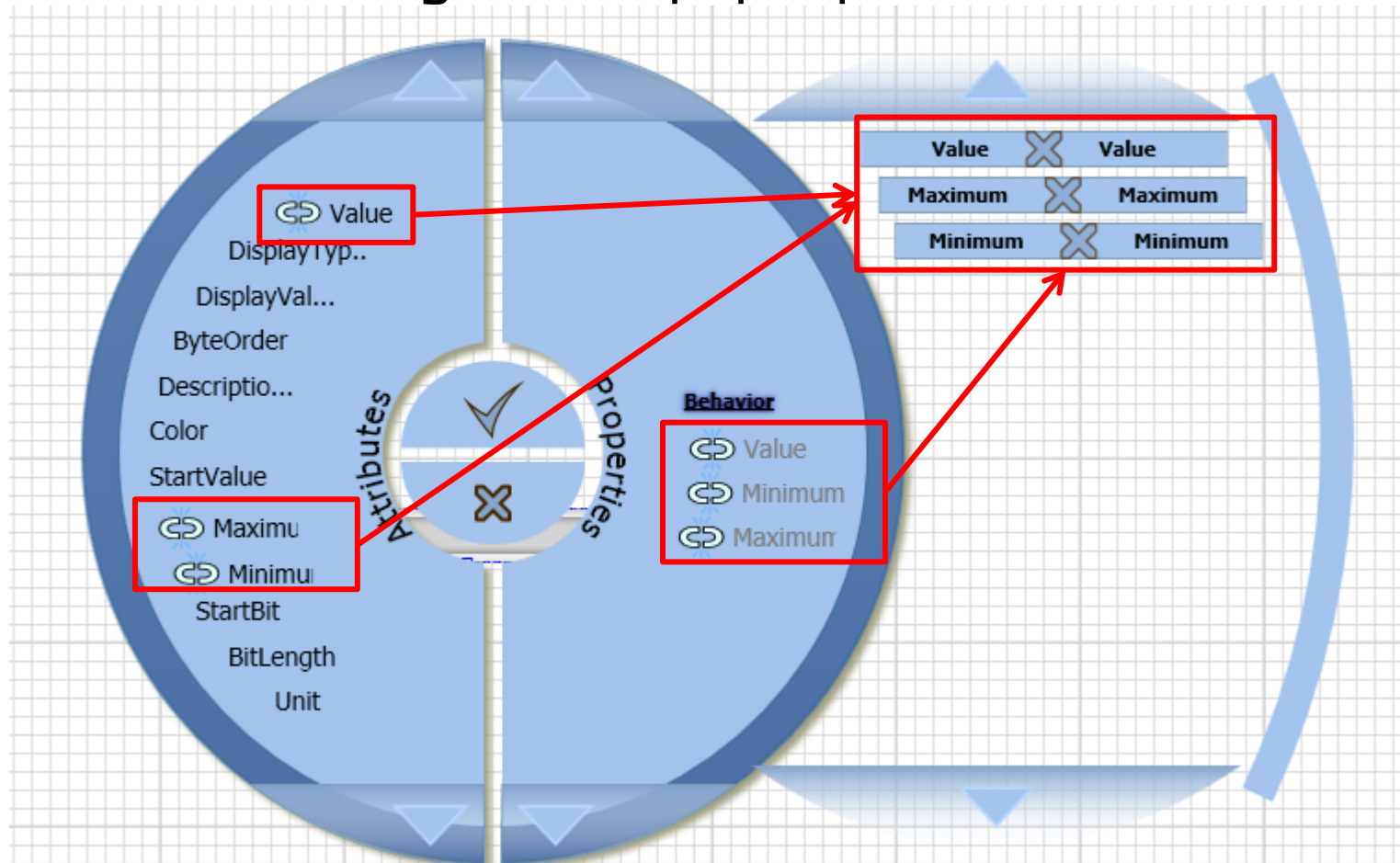
Basics – Usage of database

- Select attribute on each side by mouse click
- Confirm the selection by press 
- Configuration pop-up menu can be closed by  or ESC



Basics – Usage of database

- Already bound elements will be shown on the right side of the configuration pop-up menu



Design of RichPanel

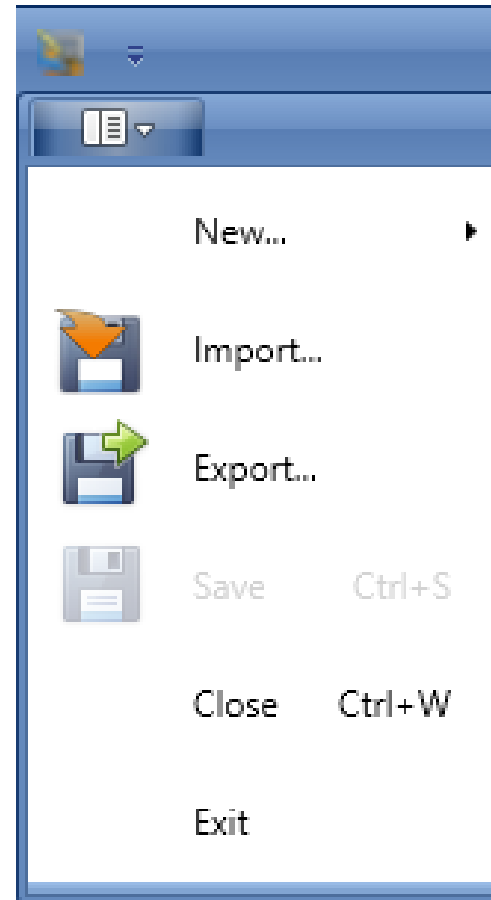
Creating an RichPanel

- Our Example
 - Velocity (realized with “increaser” control)
 - Revolution (realized with an “slider” control)
 - Tank level (realized with “flask” and “trackbar” control)

Design of RichPanel

Creating an RichPanel

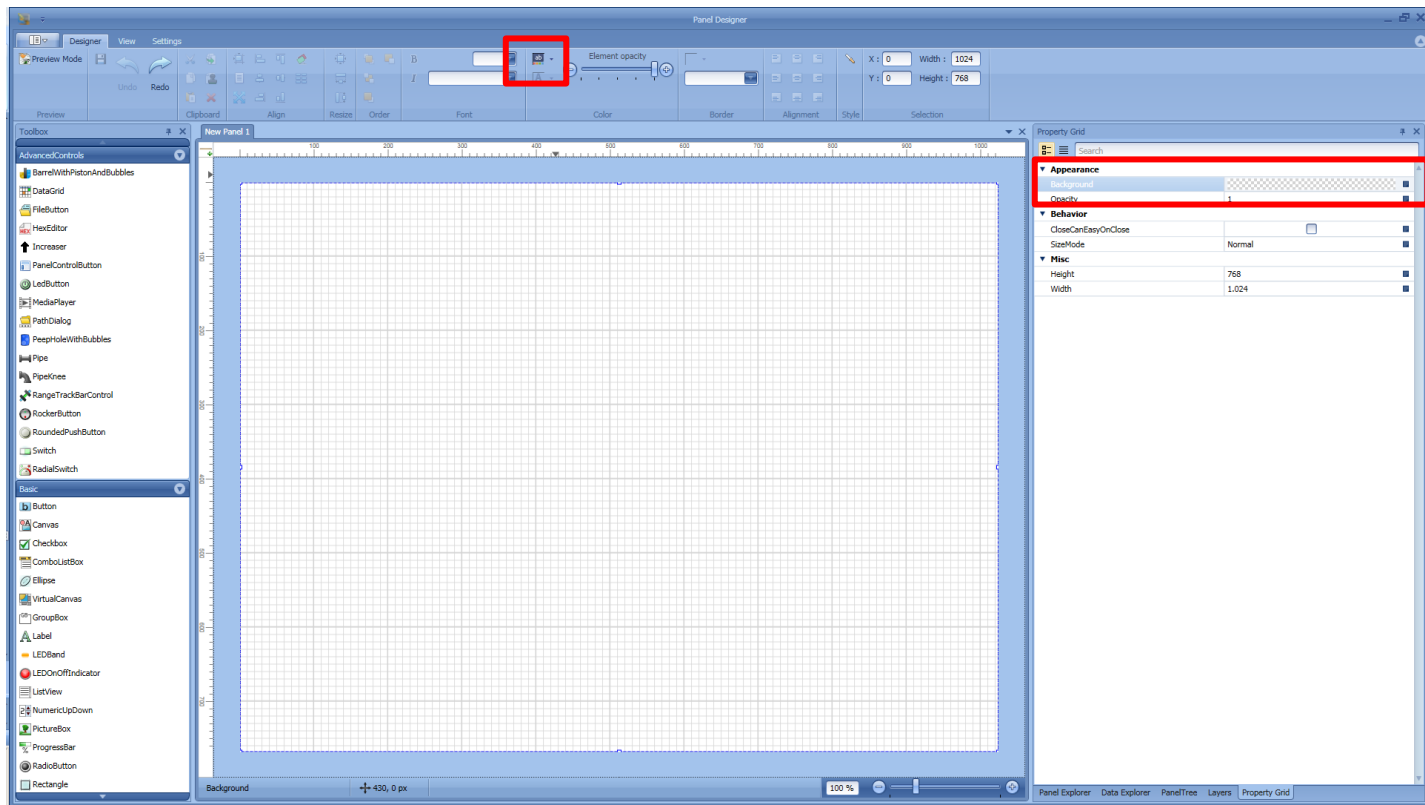
- Open designer panel
- Create new panel



Design of RichPanel

Creating an RichPanel

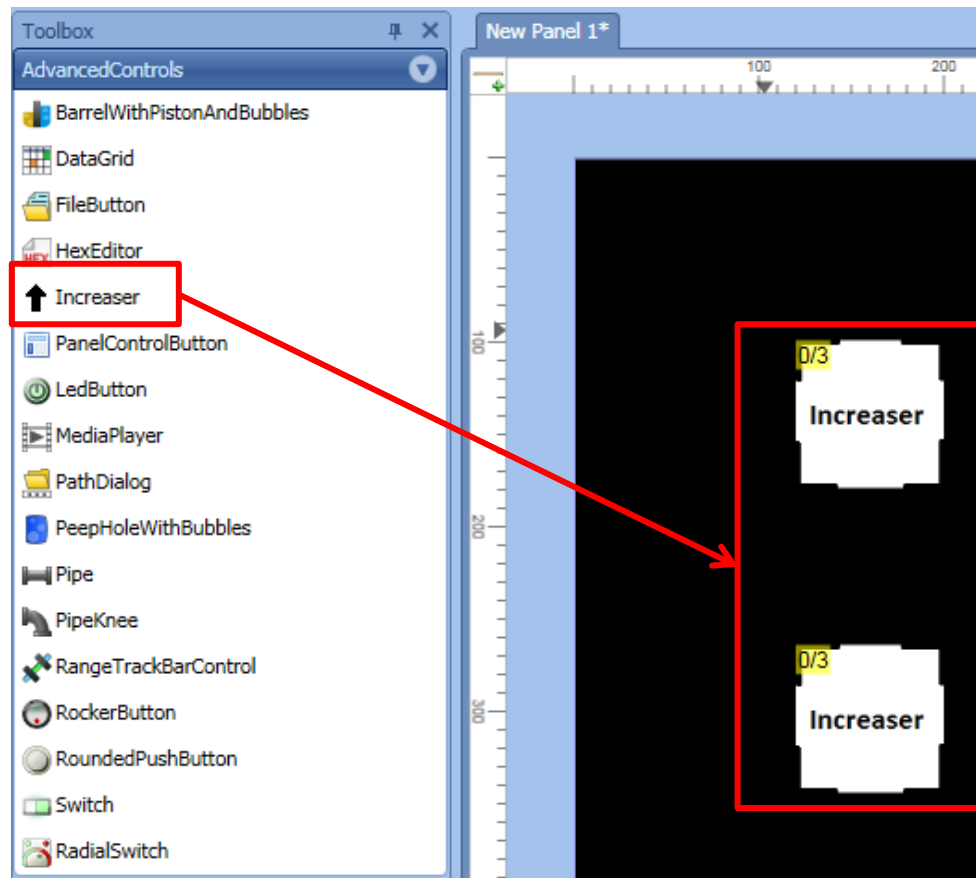
- Change the background to black



Design of RichPanel

Creating an RichPanel

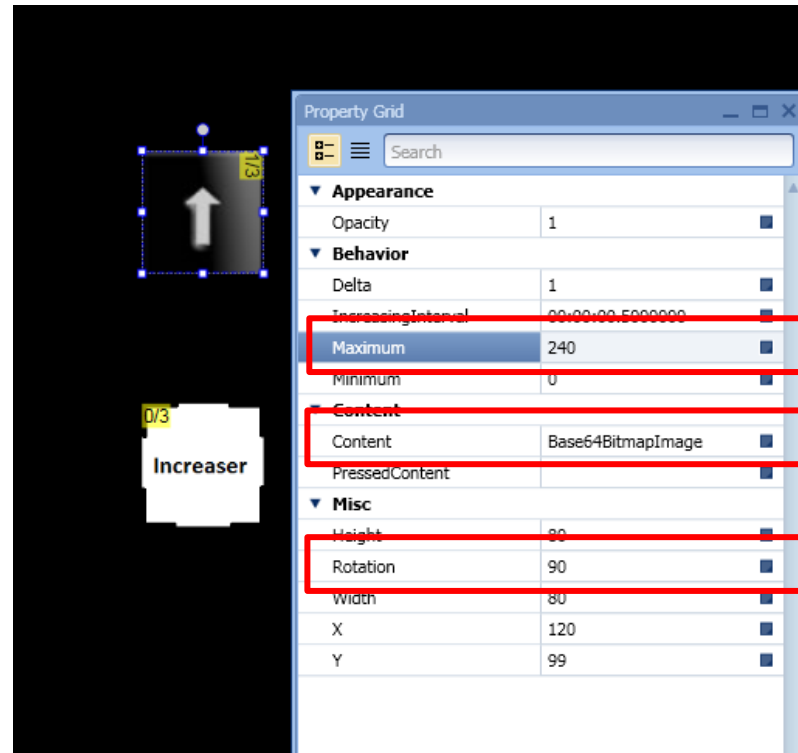
- 2 controls “Increaser” will be used for speed
 - Toolbox->AdvancedControls->Increaser



Design of RichPanel

Creating an RichPanel

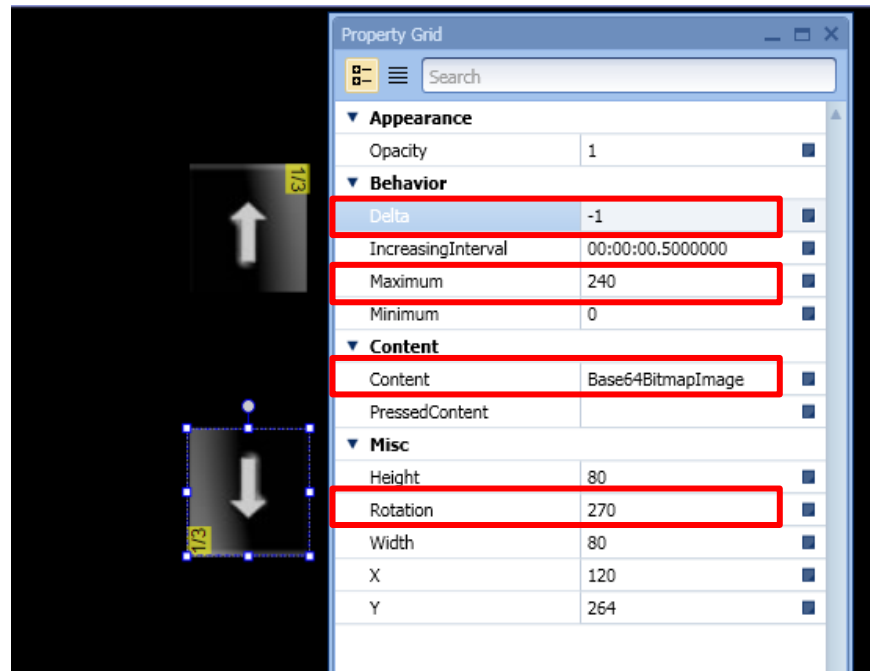
- Properties can be changed as below
 - Assign element:
`//DB/Channel:Car/node:Motor/Msg:Motor1/Sig:CurrentSpeed`
 - Property Grid->Content->Content: "C:Program Files (x86)\CanEasy\Demonstrator-Suite\EXCar\reset.png"



Design of RichPanel

Creating an RichPanel

- Properties can be changed as below
 - Assign element:
//DB/Channel:Car/node:Motor/Msg:Motor1/Sig:CurrentSpeed
 - Property Grid->Content->Content:"C:Program Files (x86)\CanEasy\Demonstrator-Suite\EXCar\reset.png"

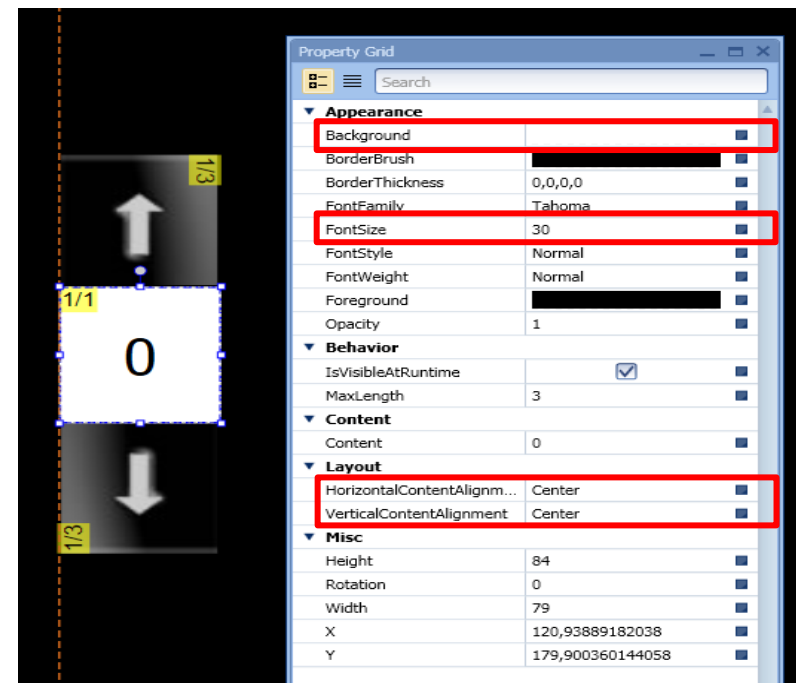
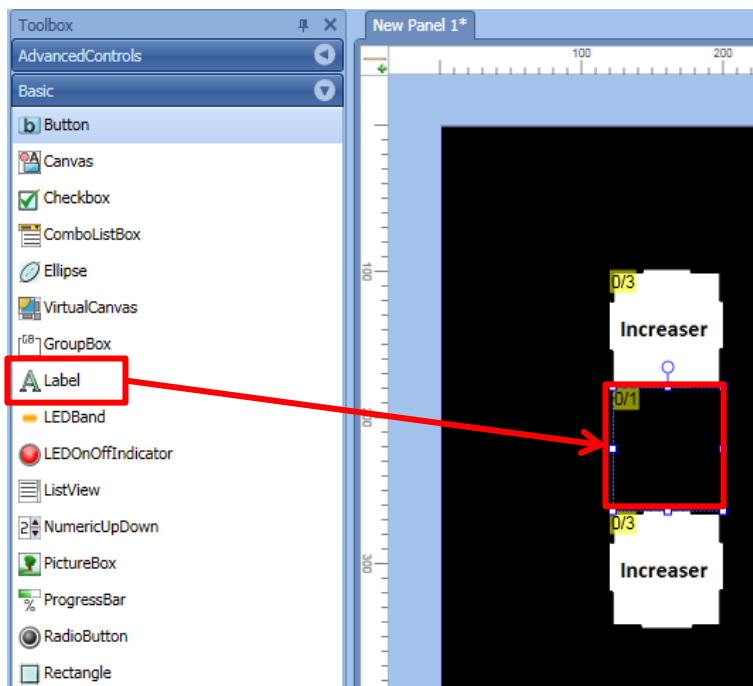


Design of RichPanel

Creating an RichPanel

- Control for display speed value
 - Toolbox->Basic->Label

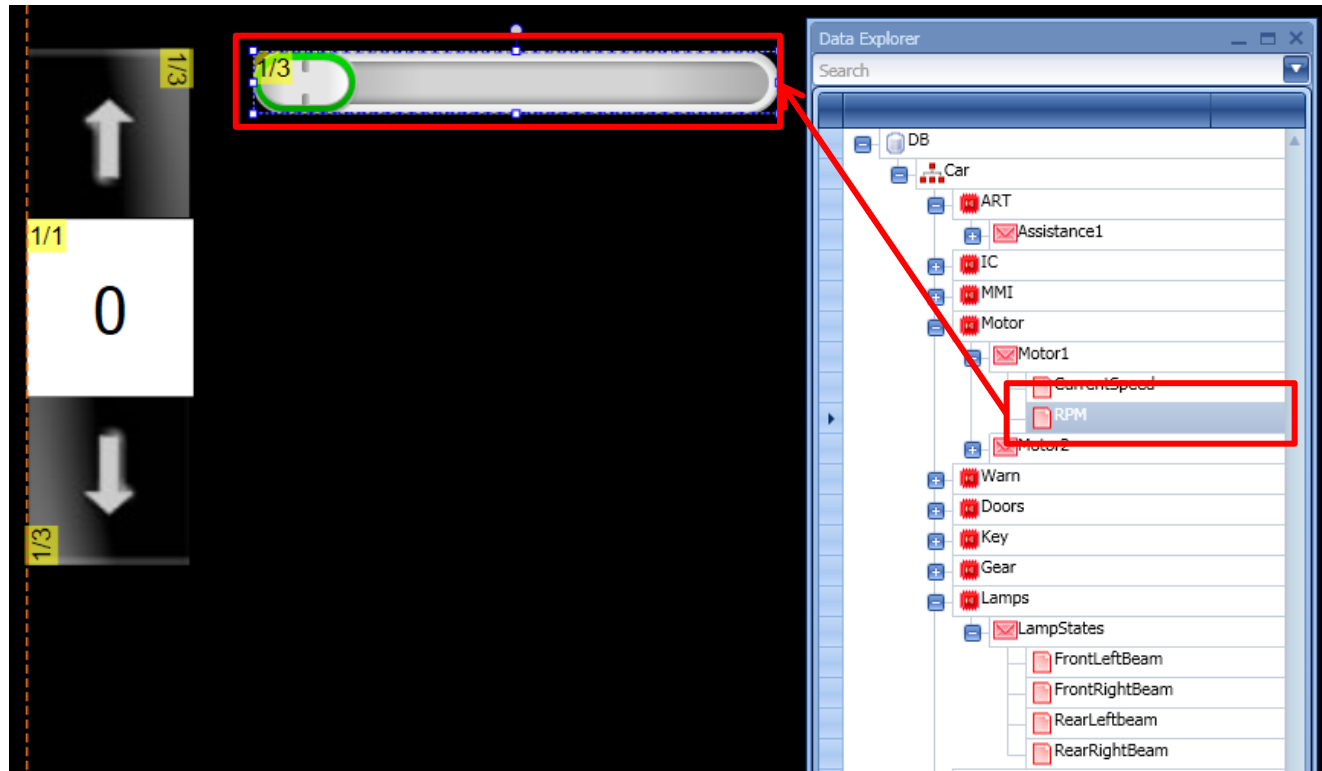
- Change properties as below
 - Assign element:
//DB/Channel:Car/node:Motor/Msg:Motor1/Sig:CurrentSpeed



Design of RichPanel

Creating an RichPanel

- Control "Slider" will be used for revolution
 - Toolbox->Basic->Slider
 - Assign element: //DB/Channel:Car/node:Motor/Msg:Motor1/Sig:RPM



Design of RichPanel

Creating an RichPanel

- Tank level control
 - Toolbox->Gauges->Flask
 - Assign element: //DB/Channel:Car/node:Motor/Msg:Motor2/Sig:Tanklevel
 - Change properties as below

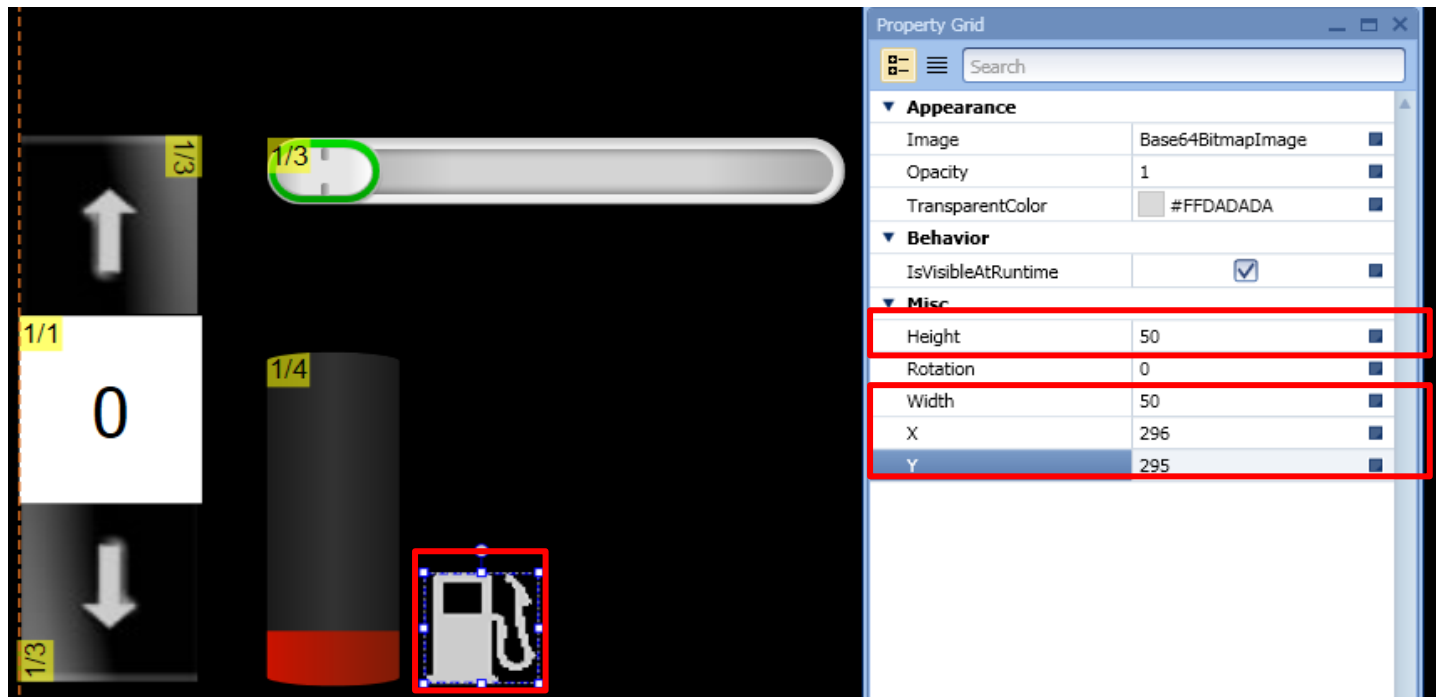
The screenshot displays a RichPanel design on the left and its Property Grid on the right. The RichPanel contains a vertical stack of three elements: a top gauge with an upward arrow and a '1/3' label, a middle gauge with a downward arrow and a '1/3' label, and a central gauge with a red fill and a '1/4' label. The Property Grid on the right shows the following properties:

Property Grid	
Search	
Appearance	
Background	
BorderColor	
BorderWidth	0
Foreground	
Opacity	1
RadiusY	4
Behavior	
AnimationDuration_ms	300
EnableAnimation	<input checked="" type="checkbox"/>
MaxValue	100
MinValue	0
Value	59
Misc	
Height	150
Rotation	0
Width	58
X	108
Y	97

Design of RichPanel

Creating an RichPanel

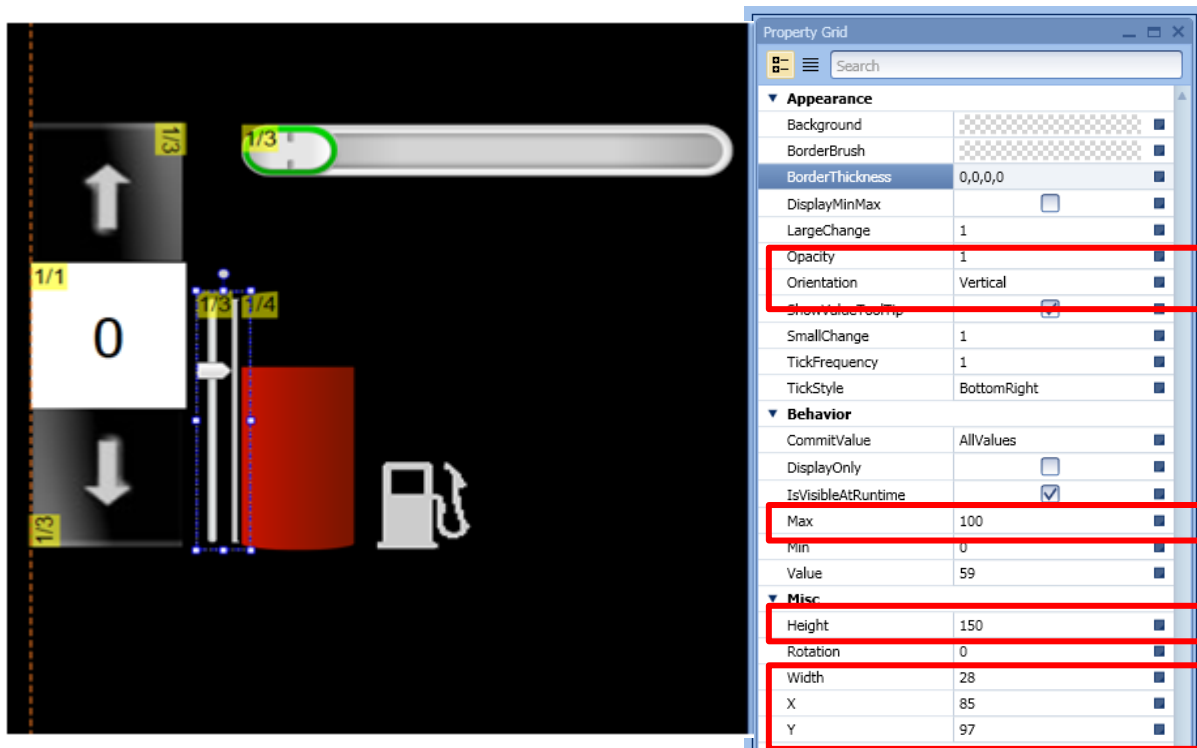
- Tank level control
 - Toolbox->Basic->PictureBox
 - Property Grid->Appearance->Image: "C:\Program Files (x86)\CanEasy\Demonstrator-Suite\EXCar\benzin.png"



Design of RichPanel

Creating an RichPanel

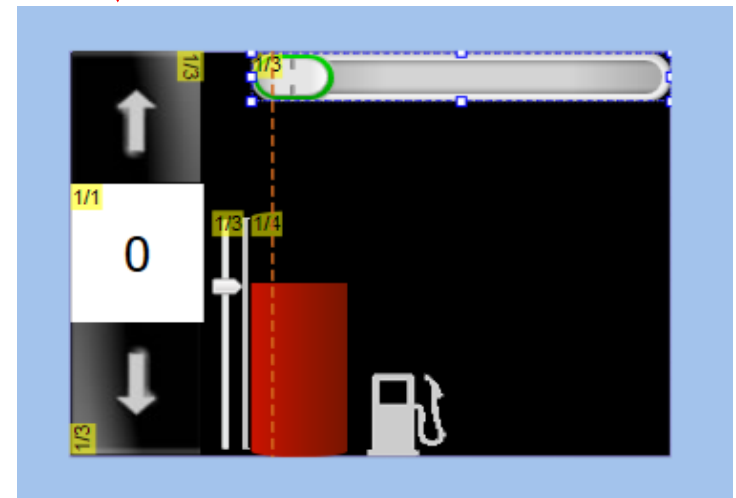
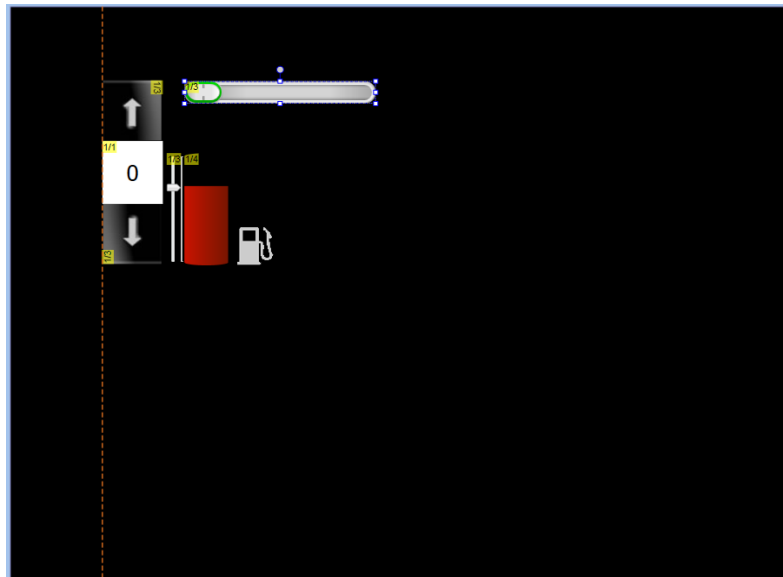
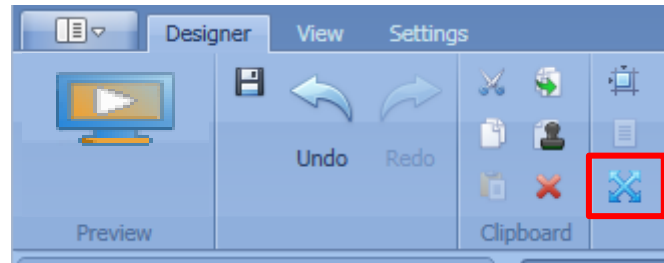
- Tank level control
 - Toolbox->Basic->Trackbar
 - //DB/Channel:Car/node:Motor/Msg:Motor2/Sig:Tanklevel
 - Change properties as below



Design of RichPanel

Creating an RichPanel

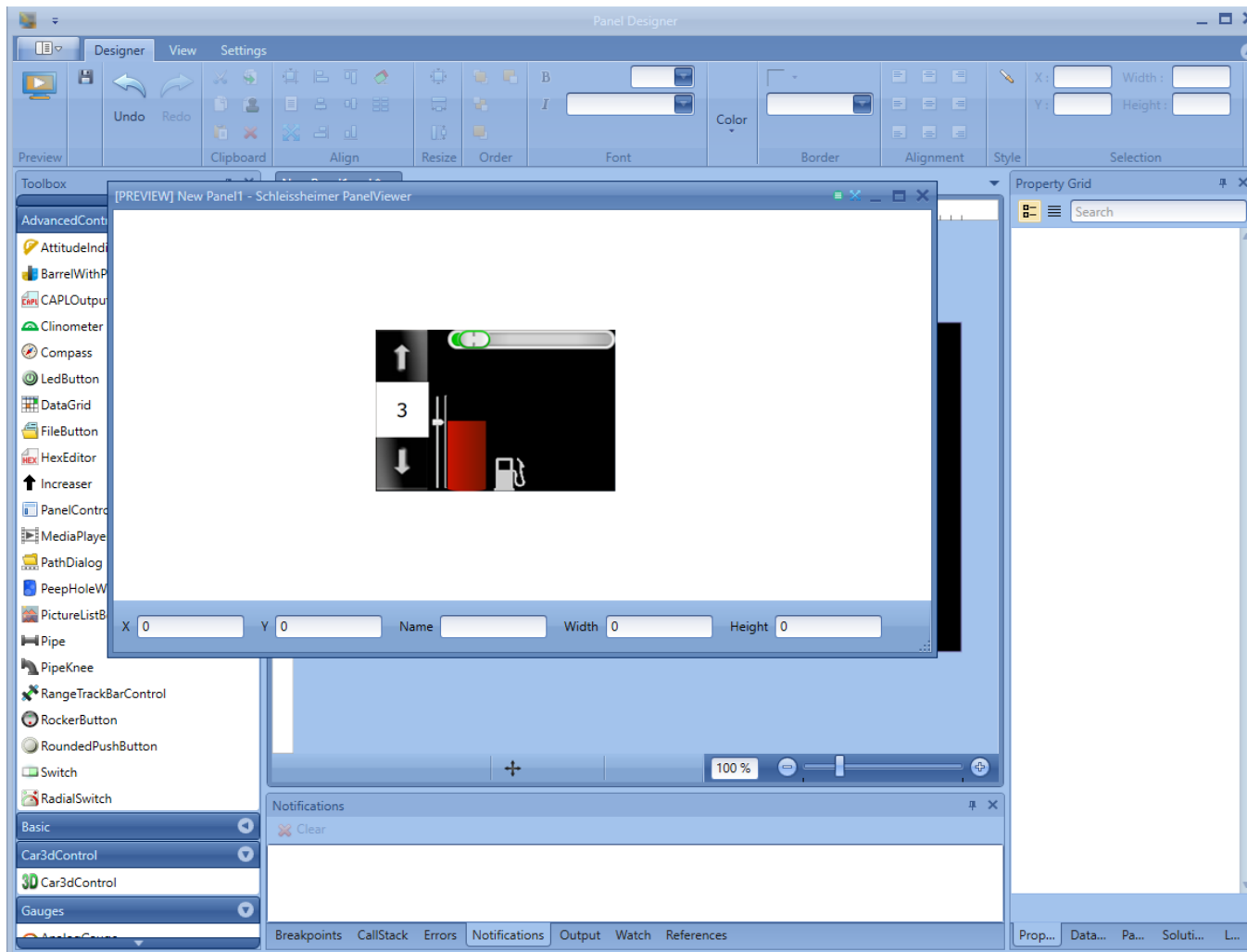
- Adjust RichPanel to the current set of controls by one-click onto:



Design of RichPanel

Creating an RichPanel

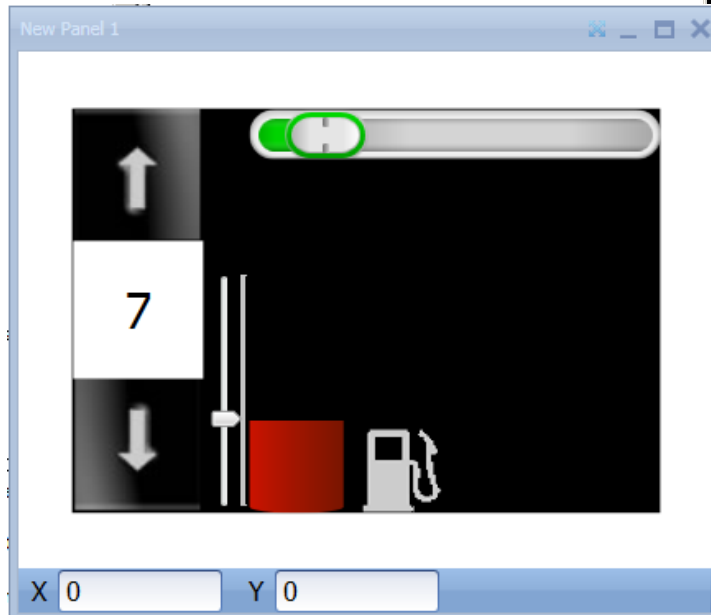
- Preview of the RichPanel:



Design of RichPanel

Creating an RichPanel

- With this panel the ExCar can be controlled



Adapt controls by export file

- Export RichPanel as .spd
- Open in text editor
- Edit properties
- Save and Import in CanEasy

```
{
  "#v": 2,
  "RichPanel": {
    "Id": "0eafd9b2-955d-463e-85c0-3f20e78057a0",
    "Name": "New Panel 1",
    "CloseCanEasyOnClose": "False",
    "Content": {
      "$type": "BackgroundCanvas",
      "Name": "Background",
      "ZIndex": 0,
      "Background": {
        "$type": "SolidBrush",
        "Color": "#FF000000"
      },
      "CloseCanEasyOnClose": "False",
      "Height": 247,
      "Width": 358.26086956521738,
      "Opacity": 1,
      "SizeMode": "Normal",
      "Controls": [
        {
          "$type": "Increaser",
          "Name": "Increaser1",
          "Content": {
            "$type": "Base64BitmapImage",
            "Base64Source": "iVBORw0KGgoAAAANSUhEUgAAAD4AAAA7CAY"
          },
          "ZIndex": 0,
          "Delta": 1,
          "Height": 80,
          "Width": 80,
          "IncreasingInterval": "00:00:00.5000000",
          "Maximum": 240,
          "Minimum": 0,
          "Opacity": 1,
          "Rotation": 90,
          "X": 0,
          "Y": 0
        },
        {
          "$type": "Increaser",
          "Name": "Increaser2",
          "Content": {
            "$type": "Base64BitmapImage",
            "Base64Source": "iVBORw0KGgoAAAANSUhEUgAAAD4AAAA7CAY"
          },
          "ZIndex": 1,
          "Delta": -1,
          "Height": 80,
          "Width": 80,
          "IncreasingInterval": "00:00:00.5000000",
          "Maximum": 240,
          "Minimum": 0,
          "Opacity": 1,
          "Rotation": 270,
          "X": 0,
          "Y": 165
        }
      ]
    }
  }
}
```

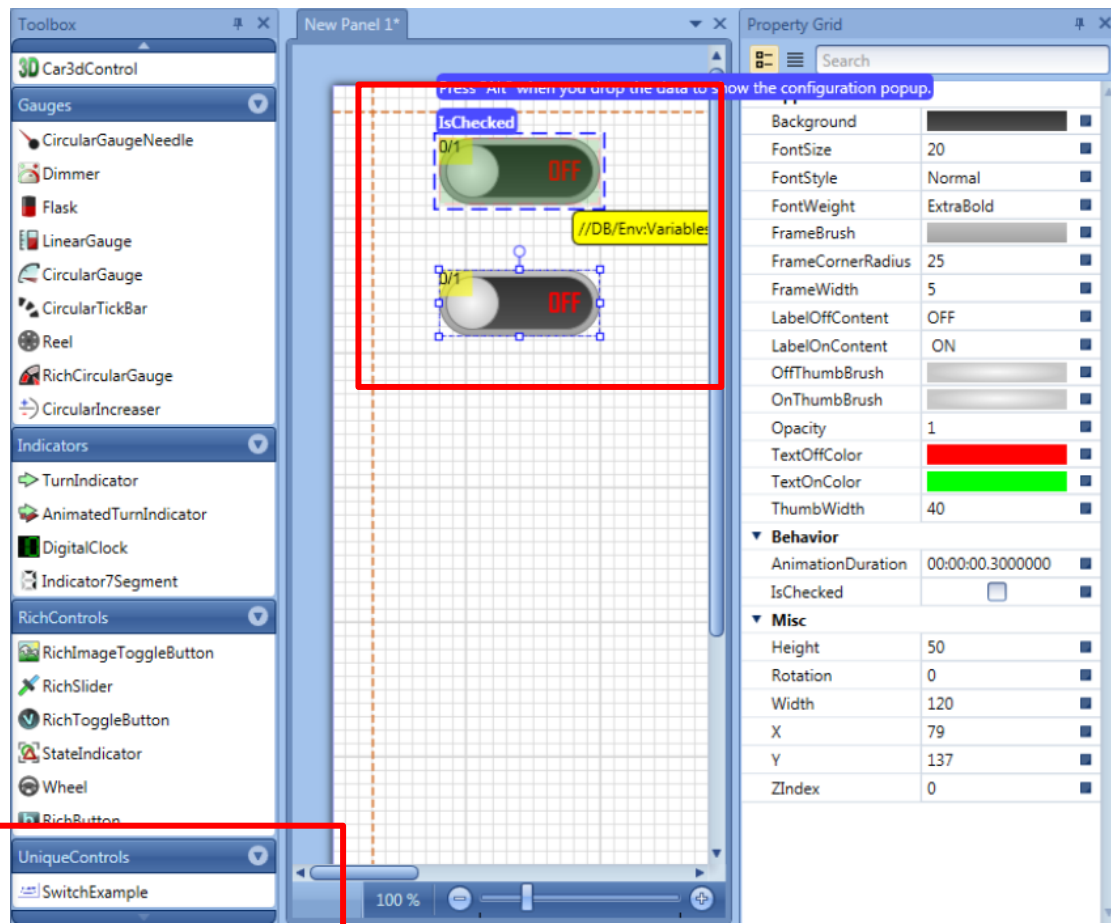
Create new Controls

- Controls can be new created
- An example for creating new control is available under: "C:\Program Files(x86)\CanEasy\HowTo\UserControl Samples\User Controls.pdf"



Create new Controls

- New control "SwitchExample" created
- New category "UniqueControls" added



Thank you for your attention!
