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Summary: This whitepaper document will help you on creating your own Process View and Control Panel designs using the NeuroCheck design tools.

Note: This document is not part of the official NeuroCheck product documentation.

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1. Introduction

Within NeuroCheck you have the option to customize your automatic mode graphical user interface. Often you will need to adapt a Process View to your specific application. Sometimes you will even want to change the layout or look of your Control Panel.

With the NeuroCheck Process View and Control Panel designers you can make your own custom-tailored Process Views and Control Panels. You can even give them a unique look according to your company's corporate design guidelines by adding your company logo, using your corporate colors, fonts and key visuals. You can find these advanced techniques in a separate section.

2. General Hints

2.1. Design of a custom layout according to existing layouts

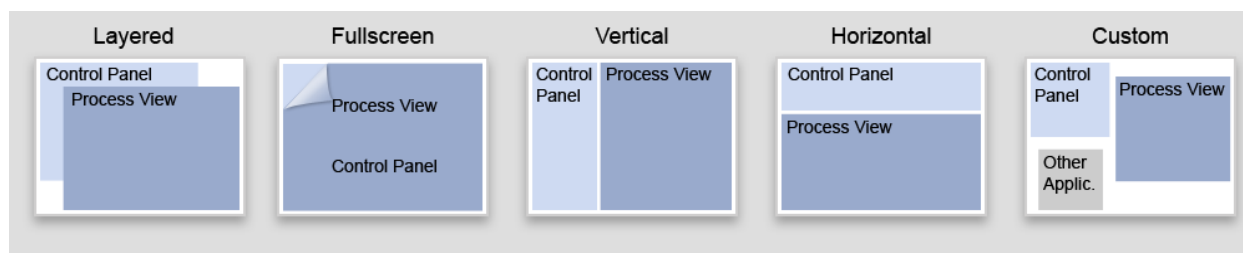
You can start to design your own custom Process View or Control Panel according to the screen layouts included in NeuroCheck. These layouts are optimized for the most common screen sizes and are a good starting point for your own outline.

2.2. Starting from scratch

When starting from scratch you first should evaluate the desired screen size and functionality and which controls you want to use. Basically consider where you want to put the control buttons and displays with the most applicable usability in mind. And feel free to make your own stunning designs.

2.3. Screen layout and size

Depending on the screen size and the elements you might want to have on your desktop you should define your screen layout. Whether you want to use only a Process View or Control Panel or Process View and Control Panel together it will influence the positioning of the elements.



When designing for an industrial environment please have in mind that most common industrial monitors have less resolution than your desktop monitor. Avoid Process View or Control Panel sizes that exceed the screen resolution because it will generate scroll bars on your window. You do best when you reduce the panel layout size a little bit for the window borders, the caption and status bars and the Windows® start bar.

2.4. Run-time performance

Keep in mind that extensive visualization needs processor time and thus will slow down the inspection process. Please stay in close contact with the application engineers to evaluate the grade of visualization time available.

3. Process View or Control Panel Design – step by step

3.1. Setting of the layout size

- Open the Process View Designer or Control Panel Designer.
- Set the Process View or Control Panel size in the property grid.

3.2. Positioning the Controls

- In the tool bar of the Process View Designer or Control Panel Designer you will find the controls. You can drag and drop them at the position you want and change the size by dragging the handles when selected. Magnetic help lines will help you positioning and aligning the controls.

3.3. Bindings

- To add functionality to your Process View or Control Panel controls you have to set the correct bindings (*Property grid* → *Bindings* or *Property grid* → *Display content*). For many controls you can select from a list of several display modes or source items to be displayed. In the Process View Designer there are even some visualization windows that require the loaded check routine to bind the visualization to the desired source items.

3.4. Tweaking the Controls

You can tweak the appearance of the controls by setting several parameters.

- **Toggle the title display on/off:**
Often – especially with small screen sizes – it may be necessary to spare some space.
- **Toggle the status bar on/off:**
In case you want to show or hide status information.
- **Background style (solid or gradients):**
To achieve a special look of some controls you can set the control background to solid or gradient.
- **Borders (style/width):**
You can put a border around some controls. Choose between several styles (Fixed3D, FixedSingle, FixedWidthMonochrome or none). In case of using FixedWithMonochrome you can set the border width and color.

3.5. Fonts

- **Font type and font size**
Font parameters of controls like font type and font size are set in the property grid.

3.6. Setting the colors

You can set the colors by choosing from different color palettes (Custom, Web, System) or by entering color values in several formats: Hex (#rrggbb), RGB (r; g; b).

- **Background colors**

Set the background colors of the controls. In some controls you have the possibility to define two background colors if using a background gradient. When background style is set to solid only background color 1 is used.

- **Transparency**

Some controls like the LED control give you the ability to set the background color to 'Transparent' (*Property grid* → *LED background color* → *Transparent [Web palette]*)

- **Text colors**

You can set the font color of the free text control as well as the text color of most others controls.

- **Control colors**

You can define several parameters of the control's appearance.

- **LCD counter/LCD matrix**

You can customize the size of the LCD matrix control by setting the number of characters and rows and the size of pixels. To achieve a more realistic look of these controls you can set the color of active/inactive segments or pixels. Tip: RGB color values that differ +/- 10 between background and inactive segments will give good and subtle results.

For example: Inactive segments RGB (50; 50; 50) / background segments RGB (60; 60; 60)

3.7. Progress bar placement (Control Panel only)

Keep in mind to assign some place for the progress bar that occasionally may appear.

3.8. Choose your design in the preferences

After you saved your work you can close the designer and choose your design in the NeuroCheck system preferences dialog: *System* → *Software Settings* → *Automatic Mode* → *Process View / Control Panel* → *Individual Design*

If you need to use different check routines you should assign the Process View in the check routine properties dialog in ... → *Automatic Mode* → *Process View*.

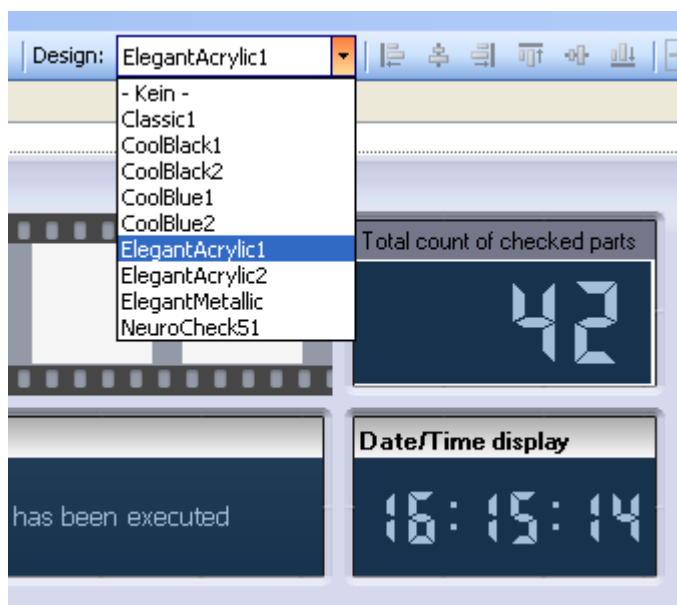
Now your Process View or Control Panel will appear in your design when switching to automatic mode.

4. Advanced graphic appearance

If you are more sophisticated the NeuroCheck Process View and Control Panel designers will offer you the tools to give your designs a unique look by using background images and additional graphics.

4.1. Using skins (Process View only)

The easy way is to put together all the controls you need, and then choosing a predefined skin in the NeuroCheck Process View designer. It will give the controls a uniform appearance and – in combination with the corresponding Control Panel – an integrated appearance.



4.2. Using a Background image

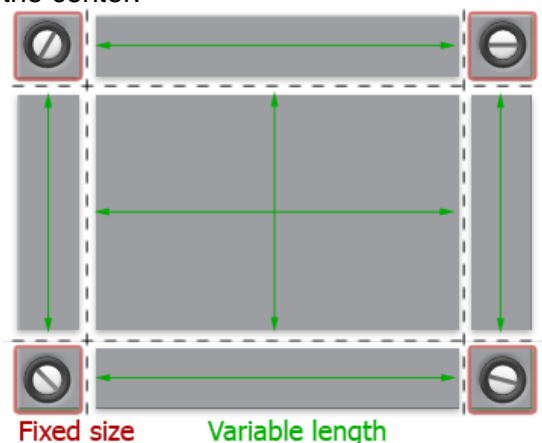
Most convincing results you will get by generating a well designed background image for your Process View or Control Panel in a graphic application of your choice. Export as PNG, GIF, TIF, BMP or JPG. You can load that image from your hard drive into your layout by choosing the file in the property grid file dialog. There are three possible ways to use a background image: Either you adjust your background image size on the exact Process View or Control Panel size, or you use a repetitive background tile (good when designing a background pattern for different screen sizes). Last you can work out a stretchable image for e.g. gradients (please mind possible distortions when scaling).

4.3. Additional graphics and eye-candy

Add a brand mark, an identifier or company logo on your user interfaces. Furthermore you can give your layout a more realistic look by adding rack handles, rack dividers, screws, bolts, lighting effects, housing parts, type plates, logos, technical parts, coffee stains and so on. Try having more depth with three-dimensional elements.

With images divided into 9 tiles you easily can put a graphical border around your screen layout or behind controls. This method is especially helpful if you plan to have different screen sizes, round corners, beveled edges ...

You can use repetitive tiles or stretched images for the variable length tiles on the edges and in the center.

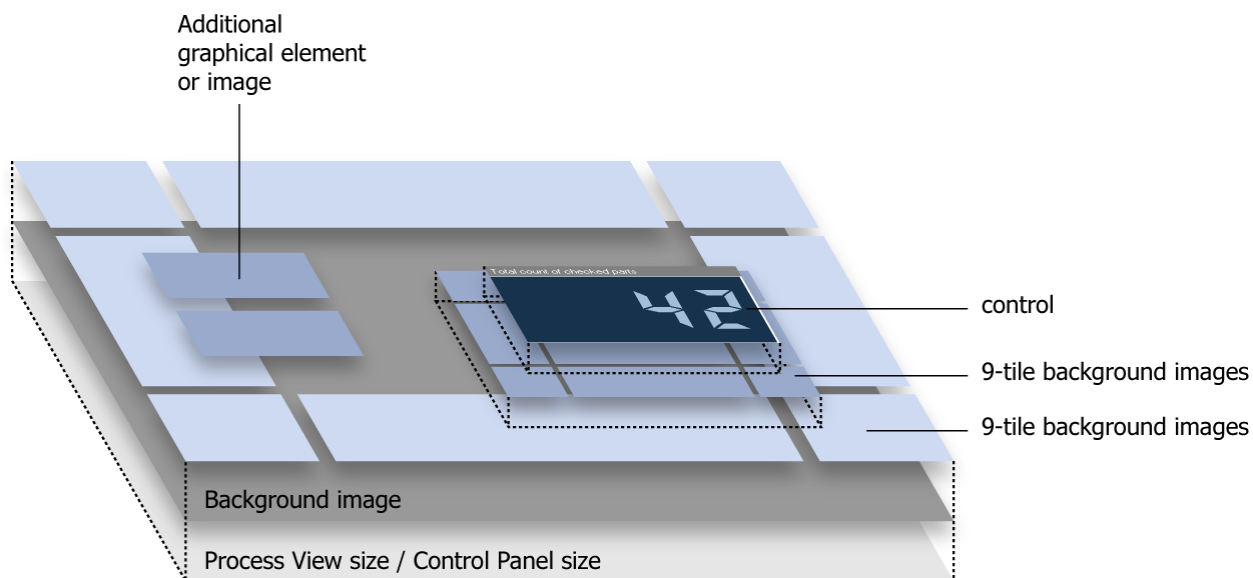


4.4. Background gradients for the controls

With a well-tuned gradient you can give controls a subtle effect simulating background lighting. For example: BackgroundStyle Gradient of any direction, Background 1 RGB (50; 50; 50), Background 2 RGB (100; 100; 100).

4.5. Layering graphics, changing the z-order

Layering graphics is an effective way to give your design a convincing and unique look while using different screen sizes. Put an image in the background; add graphics for borders and additional eye candy and drag your controls on top. With this method you achieve great flexibility when porting an already made layout to another screen size.



 In the Process View and Control Panel Designer, you can use these tools to bring a control to the front or send it to the back of the Z order.

4.6. Background for the LCD matrix control, calculation of the control size

If you plan to give the LCD matrix control a specific background it is useful to adjust the control size to perfectly fit. To calculate the absolute width and height of the pixel matrix you can use following equations:

LCD matrix (pixel size 1):

$$\text{Width} = 4\text{px [padding]} + \text{columns (number of characters)} * 12\text{px} + 4\text{px [padding]}$$

$$\text{Height} = 4\text{px [padding]} + \text{number of rows} * 16\text{px} + 4\text{px [padding]}$$

Example: LCD matrix with 23 columns and 7 rows

$$\text{Width: } 4\text{px} + (23 * 12\text{px}) + 4\text{px} = 284\text{px}$$

$$\text{Height: } 4\text{px} + (7 * 16\text{px}) + 4\text{px} = 120\text{px}$$

LCD matrix (pixel size 2):

$$\text{Width} = 4\text{px [padding]} + \text{columns (number of characters)} * 18\text{px} + 4\text{px [padding]}$$

$$\text{Height} = 4\text{px [padding]} + \text{number of rows} * 24\text{px} + 4\text{px [padding]}$$

Example: LCD matrix with 23 columns and 7 rows

$$\text{Width: } 4\text{px} + (23 * 18\text{px}) + 4\text{px} = 422\text{px}$$

$$\text{Height: } 4\text{px} + (7 * 24\text{px}) + 4\text{px} = 176\text{px}$$

LCD-matrix (pixel size 3-5):

$$\text{Width} = 4\text{px [padding]} + \text{columns} * (\text{pixel size} * 6)\text{px} + 6\text{px} + 4\text{px [padding]}$$

$$\text{Height} = 4\text{px [padding]} + \text{rows} * (\text{pixel size} * 8)\text{px} + 6\text{px} + 4\text{px [padding]}$$

4.7. Thumbnail viewer control

To give the thumbnail viewer control a film strip look you can choose 'Celluloid' in the property grid (Property grid → Style). Choose a background and celluloid color to adjust appearance.

4.8. Buttons (only Control Panel)

You can give buttons a special look by using a background image. Define overlay colors for 'Mouse Down' and 'Mouse over'. Maybe you need to adjust the button style (Property grid → Style of button).

5. Tips & Tricks

- **Usability:**

One of the most important demands in an industrial environment with high production rates and ambitiously fast part checking cycles is an optimized usability of the Control Panels and Process Views. This will help minimize reaction time and give more room for maneuver. Put great emphasis on logical positioning of controls, output windows and buttons. Short ways, logical control groups and well-controlled use of colors are great helpers.
- **Proportions**

Well-defined and harmonic proportions will help the user to keep overview when getting a glimpse of the screen. Most important information should be given more space than slightly irrelevant information.
- **Spare screen-space**

Often you will have the demand to put many information on small screens.
- **Group frames:**

Use the group frames to graphically combine elements that belong together.
- **Legibility of text:**

Put more emphasis on a proper legibility than on using many or fancy fonts. Sufficiently large texts will be read more easily from a distance, but make sure to achieve a balanced appearance.
- **Color schemes:**

Colors and especially the combination of colors have different effects. When choosing and combining colors put some emphasis on color harmony or contrast. You should be aware of specific meanings of colors (e.g. Red for warning), for specific meanings of colors in different cultures and handicapped people (color-blindness). It is not always easy to choose the right colors but it is worthwhile.
- **Keep it simple!**

Often you will have much information on your screen. Avoid too many unnecessary elements to keep your user interface tidy and readable.
- **Enjoy designing your own layouts!**