Visualization in CoDeSys V3
Requirements of a visualization tool

CoDeSys Visualization

Available visualization clients in CoDeSys
- CoDeSys Visualization
- CoDeSys HMI
- CoDeSys WebVisu
- CoDeSys TargetVisu
- CoDeSys TargetVisu Embedded

Available elements

Additional functionality

Additional tools

Availability and order code
Visualization in CoDeSys V3

Requirements

- One tool for all purposes – programming, configuration and visualization
- One single source for the creation and maintenance of the visualization
- Visualization displayed identically on the most different devices
- Individualized display depending on the user group
- Local and global access to the visualization
Visualization in CoDeSys V3

CoDeSys V3 Visualization

**Engineering:**
Graphics editor completely integrated in the CoDeSys Development System

**Runtime:**
Runtime components for TargetVisu and WebVisu
No runtime component required for integrated visualization and HMI
Visualization in CoDeSys V3

Advantages (1)

Efficient
through integration, reusability and ready-to-use practical elements

Universal
through platform independence and different clients

Customizable
through styles, parameterizable visualization elements and Visual Element Toolkit
Advantages (2)

- Visualization editor fully integrated in the CoDeSys Development System
  - direct access to all PLC variables – synchronization of tag lists not required
  - project is automatically monitored for errors (application and visualization are cross checked)

- Symbol library with controls for all common automation applications which can be visually customized using visualization styles
Advantages (3)

- Creation of customized elements
- Visualization objects with parameter interface
  - data allocation to FB instances
  - reusability – visualization is only created once
- Different clients – the ideal solution for every application
  - simultaneous usage of all clients possible
  - platform-independent visualization clients for everything from embedded devices to PC-based control panels
**Functionality**
- Visualization integrated in the engineering tool
- No RTS adaptation required

**Application**
- Application development, commissioning, maintenance and service
Advantages

• Editor is free of charge and provided as part of the development system
• Visualization editor fully integrated in CoDeSys
### Functionality
- The TargetVisu is an extension of the runtime system.
- Functions, properties and methods from visualization elements can be directly called.

### Application
- Machine or plant operation, service

### Advantage
- Platform-independent
**Functionality**
- The TargetVisu is an extension of the runtime system.
- Visualization displayed on small systems without graphics library

**Application**
- Small displays with limited system resources
Advantages

- Low adaptation effort as work is done directly on the graphics memory
- Target systems with only limited system resources and without operating possible
Properties

- Choice of different fonts which are added as a header file (tool for the creation of the header file is provided).
- Graphics format .bmp
- Bezier curves and polygons (with line width 1) are not yet supported.
- Type of graphics memory: Alignment from left to right and from top to bottom
- Colour depth > 8 bit
**Functionality**
- Visualization via internet / intranet
- The web server is a component of the runtime system.
- The client browser is a Java applet.

**Application**
- Remote maintenance, diagnostics, remote monitoring
Advantages

- Works on all Java supporting platforms such as Windows, Linux
- Global controller access via standard browser
With the CoDeSys HMI the visualization can be displayed on external devices without PLC functionality.
### Functionality

- The CoDeSys HMI is a visualization runtime for displaying screens created with the CoDeSys Development System. This runtime is usually executed on a different device than the actual PLC application.
- The usage is platform independent as the HMI is based on the TargetVisu.
- Currently available: Ready-to-use adaptations for Windows, Windows CE, Linux
- No CoDeSys project required on the HMI device, as only the boot application is required there.
- Multi-PLC: Several controllers can be displayed on one HMI device.
- Visualization on several devices via data server

### Application

- machine operation
Creating a CoDeSys HMI

- Insert as object in the Visualization Manager
- The button “Create HMI” adds the HMI application to the project tree, configures it and performs an error check.
- Alternatively: Automatic creation or update of the HMI application when PLC application is downloaded
Advantages of the CoDeSys HMI

**Easy**

The HMI visualization for an application can easily be created and inserted whenever needed.

**Fast**

The automatic creation of the HMI visualization saves time (compared to the previous version).
We software Automation.

**Visualization in CoDeSys V3**

**Available elements**

- Basic elements
- Common Controls
- Alarm Manager
- Measurement Controls
- Lamps/Switches/Bitmaps
- Special Controls
Basic Elements

- Rectangle (rounded)
- Ellipse
- Line, Polyline
- Polygon
- Bezier curve
- Image
- Frame
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Common Controls
Visualization in CoDeSys V3

Measurement Controls

ToolBox:
- Basic
- Common Controls
- Alarm Manager
- Measurement Controls
  - Pointer
  - Bar Display
  - Bar Display free configurable
  - Meter 90°
  - Meter 180°
  - Meter 360°
  - Meter free configurable
  - Potentiometer
  - Potentiometer free configurable
- Histogram
- Lamps/ Switches/ Bitmaps
- Special Controls
Visualization in CoDeSys V3

Lamps/Switches/Bitmaps

ToolBox
Basic
Common Controls
Alarm Manager
Measurement Controls
Lamps/ Switches/ Bitmaps
  Pointer
  on/off Imageswitcher
  Lamp
  Dip switch
  Power switch
  Push switch
  Push switch Led
  Rocker switch
  Rotary switch

Special Controls
Visualization in CoDeSys V3

Special Controls
Visualization in CoDeSys V3

Example: Switches/Lamps/Bitmaps
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Example: Measurement Controls

![Measurement Controls Diagram]
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Example: Input
**Alarm Management**

- Starting from CoDeSys Version 3.5: easy and comfortable configuration, management and visualization of alarms
- Functionality directly available in the toolbox
  - Alarm banner to display the current alarm message
  - Alarm table to display active alarms
Visualization Styles

- Visualization styles can be used to specify a certain number of element properties in a style file.
- The end user can create a style file for a consistent look and feel which is in line with his company’s corporate identity. This style file defines the used...
  - colors, shapes
  - fonts, bitmaps, logos

**Advantage:**
If a style property is changed, all elements in the visualization are changed automatically, which saves a lot of time.
**Additional Functionality**

**Styles in the Visualization**

- The selected style can easily be changed in the visualization manager.
- The version of the selected style is specified in the project settings.
- Further styles can be created by the user.
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Additional Functionality

- Dynamic image switching: Switch between two images (.bmp) depending on the PLC values assigned
- Multi-language support in visualization with an integrated text list editor
- Image in image: Visualization is parameterizable and reusable
- Simulation of the application without hardware
- Visualization has access to the recipe manager
CoDeSys VisuElement Toolkit

- For the creation of customized visualization elements with IEC 61131-3 code
- Clear advantage through already available ready-to-use standard elements or specialized industry-specific elements
- Competitive edge through extended offer of useful elements
### Visualization in CoDeSys V3

**Availability and order code**

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<thead>
<tr>
<th>Product</th>
<th>Form of delivery</th>
<th>Order code</th>
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<td>CoDeSys Visualization</td>
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<tr>
<td>CoDeSys TargetVisu Embedded</td>
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<td>CoDeSys VisuElement</td>
<td>Toolkit plus workstation license</td>
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