Creating Canvas Displays How-to

Design flexible, dynamic canvas-style displays.

How-to **Pillars** **Operator** **Displays** Canvas | Tutorial | How-To Guide | Reference

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Overview

This guide walks you through creating Canvas displays for process graphics, P&IDs, and fixed-layout HMI screens. Canvas displays maintain element relationships during resize, making them ideal for process visualization.

Prerequisites:

- Tags configured in Unified Namespace
- Understanding of process graphics requirements
- Symbols or graphics to represent equipment

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Creating Your First Canvas Display

Step 1: Create Display

1. Navigate to **Displays** **Draw**
2. Click **New Document** button
3. Configure:
    - **Name**: ProcessOverview
    - **Engine**: Portable
    - **Template**: Select "Canvas" (not Dashboard)
4. Click **OK**

Step 2: Set Canvas Properties

In the right sidebar under **Display Settings**:

- **Width**: 1920 (typical for Full HD)
- **Height**: 1080
- **Background**: Theme or custom color
- **OnResize**: StretchUniform (maintains aspect ratio)

Adding Process Elements

Method 1: Drag Tags for Automatic Graphics

1. From right panel **Tags tree**, expand your tags
2. Drag a tag directly onto canvas
3. System creates appropriate visualization:
    - **Digital tags** On/Off indicator
    - **Integer/Double** Numeric display
    - **Custom types** Symbol if mapped

Tip: Map tags to symbols first in **UNS** **Tags** using "Map to Symbol" button for automatic symbol selection.

Method 2: Using Symbol Library

1. In left panel, expand **Symbols** folder
2. Browse categories:
    - **Motors** Motor symbols with wizards
    - **Pumps** Various pump types
    - **Valves** Gate, ball, butterfly valves
    - **Tanks** Storage vessels
3. Drag symbol onto canvas
4. Double-click to configure parameters

Method 3: Drawing Custom Graphics

Use the **Drawing toolbar** (left side):

Tool	Use Case	Tip
Rectangle	Tanks, buildings	Hold Shift for square
Ellipse	Vessels, indicators	Hold Shift for circle
Polyline	Piping, connections	Click points, Enter to finish
Polygon	Complex shapes	Click points, close to finish

Configuring Symbol Parameters

When you add a symbol with dynamic properties:

1. **Double-click** the symbol
2. In **Symbol Configuration** dialog:
    - **Parameters** section shows available bindings
    - Click **...** to browse for tags
    - Or type tag name directly

Example for a motor symbol:

```
STATE: Tag.Motor1.Running
SPEED: Tag.Motor1.Speed
FAULT: Tag.Motor1.Fault
```

Adding Dynamic Behavior

Quick Dynamics Setup

1. **Select** any element
2. **Double-click** to open properties
3. Click **Dynamics** tab
4. Add dynamic properties:

Color Change by Value:

- Type: **FillColor**
- Expression: `Tag.Temperature`
- Change Color: **UsingLimits**
- Add limits: 0=Blue, 50=Green, 80=Yellow, 100=Red

Visibility Control:

- Type: **Visibility**
- Visible: `Tag.SystemRunning`
- Element shows only when tag > 0

Animation:

- Type: **Rotate**
- Expression: `Tag.FanSpeed`
- Range: 0-100 Angle: 0-360

Creating Interactive Controls

Button for Commands:

1. Add button from toolbar
2. Double-click **Action** dynamics
3. Configure:
    - Event: **MouseLeftButtonDown**
    - Action: **SetValue**
    - Object: `Tag.Motor1.Start`
    - Value: `1`

Building a Complete Process Display

Typical P&ID Layout

```
Header: Title and Status

Main Process Area (Canvas)

    ??? Equipment (Symbols)
    ??? Piping (Polylines)
    ??? Instrumentation (Gauges)
    ??? Values (TextBoxes)

Footer: Alarms Summary
```

Step-by-Step Example: Simple Tank System

1. **Add Storage Tank:**
    - Drag Tank symbol
    - Bind Level: `Tag.Tank1.Level`
    - Bind Temperature: `Tag.Tank1.Temp`
2. **Add Inlet Valve:**
    - Position above tank
    - Bind State: `Tag.Valve1.Open`
    - Add color dynamics (Green=Open, Red=Closed)
3. **Connect with Piping:**
    - Use Polyline tool
    - Draw from valve to tank
    - Set line width: 3px
    - Add flow animation if needed
4. **Add Level Indicator:**
    - Place LinearGauge beside tank
    - Bind Value: `Tag.Tank1.Level`
    - Set Range: 0-100%
5. **Add Control Button:**
    - Place "Fill Tank" button
    - Action: Toggle `Tag.Valve1.Open`

Organizing Complex Displays

Using Groups

1. Select related elements (Ctrl+Click)
2. Click **Group** button in toolbar
3. Benefits:
    - Move together
    - Copy as unit
    - Apply dynamics to group

Layering (Z-Order)

Control what appears on top:

- **Bring to Front**: Pipes over equipment
- **Send to Back**: Background shapes
- **Switch Z-Order**: Fine control

Alignment Tools

Select multiple elements, then:

- **Align Left/Right/Center**
- **Align Top/Bottom/Middle**
- **Space Evenly** (horizontal/vertical)

Working with Templates

Creating Reusable Symbols

1. Draw your equipment representation
2. Add dynamics with parameters:
   `Expression: #STATE:Tag.PlaceHolder`
3. Select all elements

4. Click **Make Symbol** button
5. Name and save to library

Using Symbol Parameters

The # syntax creates parameters:

- `#TagName:Tag.Default` - Main tag parameter
- `#Min:0` - Numeric parameter
- `#Color:Red` - Color parameter

When placing symbol, configure each parameter once.

Testing Your Display

Preview Mode

1. Click **Preview** button in toolbar
2. Limitations:
    - No CodeBehind execution
    - Basic animations only
    - No real tag values

Runtime Testing

Better approach:

1. Keep solution running (Development profile)
2. Save display (Ctrl+S)
3. Rich Client updates automatically
4. Or refresh Web Client

Performance Optimization

Element Count Guidelines

Display Type	Max Elements	Recommended
Overview	1000	< 500
Detailed P&ID	2000	< 1000
Simple Control	200	< 100

Optimization Tips

Use symbols instead of individual elements

Limit animations to essential items

Optimize images before importing

Group static elements together

Avoid overlapping transparencies

Common Patterns

Equipment Status Indicator

Rectangle (equipment)
  FillColor (0=Gray, 1=Green, 2=Yellow, 3=Red)
  Visibility (Tag.Visible)
  Action (OpenPopup on click ("EquipmentDetails"))

Analog Value Display

TextBox (Values)
    LinkedValue (Tag.ProcessValue)
    Format (2 decimals)
    Units (°C or PSI)

Trend Popup Button

Button "Show Trend"
    Action (OpenDisplay)
    Display ("TrendPopup")
    Parameters (tag name)

Troubleshooting

Elements Not Aligned

- Use Grid: Show gridlines and snap to grid
- Use Alignment tools in toolbar

Symbol Not Updating

- Check parameter binding
- Verify tag name spelling
- Confirm tag has good quality

Display Too Slow

- Reduce element count
- Simplify animations
- Check CodeBehind for loops

Resize Issues

- Check OnResize setting
- Use StretchUniform for aspect ratio
- Test at different resolutions

Next Steps

- **[Working with Symbols]** Create custom symbol library
- **[Adding Dynamics]** Advanced animations
- **[Display CodeBehind]** Add logic to displays

This child guide focuses specifically on Canvas displays while maintaining our standard structure. It provides practical, hands-on guidance without trying to cover every feature. To explore all features use the MASTER section.

In this section...
