WebBrowser Control Reference

Display web pages inside your UI.

Reference **Controls** **Viewer** WebBrowser

Overview

The **WebBrowser** control embeds a full modern browser inside a FrameworX display. On the WPF runtimes (Windows, RichClient, SmartClient) it uses the Chromium-based WebView2 engine; on the HTML5/Web client it runs via OpenSilver as an embedded web frame. It accepts three content sources — a URL, a tag value containing HTML, or inline HTML — and exposes a JavaScript bridge (`window.RW`) that lets embedded HTML, SVG, or React components read FrameworX tags in real time.

Requirements
Configuration
    Properties
The three content modes
    1. URL mode
    2. Tag mode
    3. HTML mode
The RW JavaScript bridge
    Declarative binding: the data-rw-tag attribute
    Programmatic access from JavaScript
    React hooks: useTag and useTags
Tag writes from JavaScript
Design-time preview
Clearing cache
HTML5 client parity
Security considerations
When to use which mode
Related
Clearing Cache Step by Step

Typical uses:

- Embedding an existing web page or intranet dashboard inside an HMI display (URL mode).
- Rendering a hand-authored HTML/CSS/SVG mockup with live tag values baked in (HTML mode with `data-rw-tag` attributes).
- Hosting a small React component that reacts to tag updates via hooks (HTML mode with React CDN + `RW.useTag`).
- Driving display content dynamically from a tag whose value is an HTML string (Tag mode).

<ac:structured-macro ac:name="info"> ac:rich-text-body

This control supersedes the legacy HTML5Control component. New work should use **WebBrowser**; existing HTML5Control instances continue to run but should be migrated when convenient.

</ac:rich-text-body> </ac:structured-macro>

Requirements

Runs on two runtimes:

- **Windows / RichClient / SmartClient** — all three are WPF runtimes (SmartClient is the ClickOnce-deployed variant of the WPF client). All use embedded **WebView2** and the full feature set of this control applies. WebView2 Runtime must be present on the target machine; it is shipped with modern Windows and installed by the FrameworX installer on older machines.
- **HTML5 / Web client** — the FrameworX display runs in the browser via **OpenSilver** compiled to WebAssembly. The WebBrowser control maps to an OpenSilver web frame (iframe) embedded in the page. When the embedded content lives on a different origin than the host page, the host's `Content-Security-Policy: frame-ancestors` response header may need to be adjusted to allow framing. The `RW` JavaScript bridge and `data-rw-tag` binding target feature parity with the WPF runtime on the HTML5 client; see *HTML5 client parity* below for current status.

Configuration

1. Go to **Displays / Draw**.
2. In the Components panel, select **Viewer**, then **WebBrowser**.
3. Drop it onto the Draw area.
4. Double-click the control to open its configuration dialog.
5. Choose **WebContentsSource** and supply the matching content field (see the three modes below).

Properties

Property	Type	Description

`WebContentsSource`	Enum: `Url`, `Tag`, `Html`	Selects the content source. See the three modes below.
`LinkedValue`	String with expressions	Used by `Url` mode (the URL) and `Tag` mode (the tag reference whose value is an HTML string). Supports tag expressions such as `@Tag.Reactor1.ReportUrl`.
`HtmlContent`	String	Used by `Html` mode. Full HTML, a fragment, an SVG document, or a React-bearing page. May contain `data-rw-tag` attributes for automatic live binding.
`AutoWrapHtml`	Boolean (default `true`)	When `true`, fragments and bare SVG are wrapped in a minimal HTML document automatically. Set to `false` if you are supplying a complete `<!DOCTYPE html>` document and want no wrapping.
`EnableBrowserStorage`	Boolean (default `false`)	When `true`, HTML content is served to the embedded browser through a virtual host (`https://twebcontent.local/`) instead of `NavigateToString`. This gives the content a proper browser origin so `localStorage`, `sessionStorage`, and other origin-dependent APIs work. Leave off unless the embedded content actually needs these APIs.
`Background`, `Foreground`, `BorderBrush`, `BorderThickness`	Color / Thickness	Standard theming. Omit colors to inherit from the active theme.

The three content modes

1. URL mode

Embed an external web page. Set `WebContentsSource = Url` and put the address in **URL** (stored as `LinkedValue`). The value supports tag expressions, so the URL can be computed at runtime from tag values:

text https://reports.example.com/asset/{@Tag.Asset.Id}/summary

Useful for intranet dashboards, live reports, external documentation, and anything that already exists as a web page.

2. Tag mode

The HTML is supplied by a tag whose value is an HTML string. Set `WebContentsSource = Tag` and put the tag expression in **String{With Tags}** (stored as `LinkedValue`). The control reloads the HTML whenever the tag value changes.

Useful when the same display needs to show different content per asset, per recipe, or per operator role, and that content is produced by a ScriptTask, imported from a database, or delivered via an MQTT payload.

3. HTML mode

Inline HTML (or SVG, or a React-bearing page) is stored directly on the control. Set `WebContentsSource = Html` and paste the content into **HtmlContent**. This is the mode used for hand-authored mockups, Claude Design exports, and in-display React components.

HTML mode recognizes several content shapes automatically:

- **Full HTML document** (`<!DOCTYPE html>`…) — rendered as-is.
- **HTML fragment** (a bare `<div>`…) — wrapped in a minimal HTML document when `AutoWrapHtml` is on.
- **SVG document** (starts with `<svg`) — recognized as SVG and rendered natively by Chromium.
- **React-bearing page** — when the content pulls in React (via CDN `<script>` tags), the control's tag binder recognizes React patterns and wires the `RW` bridge so components can call hooks like `RW.useTag()`.

The RW JavaScript bridge

At runtime, the control injects a global `window.RW` object into the embedded page. This is the API that HTML, SVG, or React content uses to read FrameworX tag values. It is available immediately on page load — there is no explicit initialization step.

Declarative binding: the `data-rw-tag` attribute

The simplest way to bind live values is a plain HTML attribute. Any element with `data-rw-tag="TagRef"` is automatically bound — its text content is replaced with the live tag value, and the element gets a CSS class reflecting the tag's quality.

```
html <div class="card"> <h3>Reactor 1</h3> <p>Temperature: <span data-rw-tag="Plant.Reactor1.Temperature">--</span> &#176;C</p> <p>Pressure: <span data-rw-tag="Plant.Reactor1.Pressure">--</span> kPa</p> </div>
```

No JavaScript required. The initial text (`--`) is the fallback shown until the first value arrives. Quality classes (`rw-quality-good`, `rw-quality-bad`, `rw-quality-uncertain`) can be styled in CSS if you want color-coded quality indication.

Programmatic access from JavaScript

The `RW` object exposes these methods:

Method	Description
`RW.subscribe(tagRef, callback)`	Subscribe to a tag. The callback receives `(value, quality, timestamp, tagRef)` on each update. Returns an unsubscribe function.
`RW.tags.A.B.C`	Proxy-style access. Reading `RW.tags.Plant.Reactor1.Temperature` returns the current value.
`RW.isConnected()`	Returns `true` if the bridge is connected to the FrameworX runtime.
`RW.formatValue(v)`	Standard value formatting (returns `'--'` for null/undefined).
`RW.getQualityClass(q)`	Maps a quality code to a CSS class: `rw-quality-good`, `rw-quality-bad`, or `rw-quality-uncertain`.

Quality codes follow the OPC convention: `192` (`0xC0`) is Good; values in the `0x00–0x3F` range are Bad; the `0x40–0xBF` range is Uncertain.

React hooks: `useTag` and `useTags`

For React-based content, the bridge exposes hook-style helpers so components re-render when tag values change:

Hook	Description
`RW.useTag(tagRef)`	Returns `[value, quality]`. The component re-renders on each tag update.
`RW.useTags([refs])`	Returns `{ref: {value, quality}, …}` for batch subscription.

Example — a minimal React component embedded in HTML mode:

```
html <!DOCTYPE html> <html> <head> <meta charset="utf-8" /> <script src="https://unpkg.com/react@18/umd/react.production.min.js"></script> <script src="https://unpkg.com/react-dom@18/umd/react-dom.production.min.js"></script> <script src="https://unpkg.com/@babel/standalone/babel.min.js"></script> </head> <body> <div id="root"></div> <script type="text/babel"> function ReactorCard() { const [temp, quality] = RW.useTag('Plant.Reactor1.Temperature'); return ( <div className={"card " + RW.getQualityClass(quality)}> <h3>Reactor 1</h3> <p>{RW.formatValue(temp)} &#176;C</p> </div> ); } ReactDOM.createRoot(document.getElementById('root')).render(<ReactorCard />); </script> </body> </html>
```

The control detects when embedded content uses React and wires the bridge so hook calls (`RW.useTag`, `RW.useTags`) trigger hook-driven re-renders on tag updates. No extra configuration is required beyond including React via CDN scripts as shown above.

Tag writes from JavaScript

The current release of this control is **read-only** from JavaScript — embedded content can subscribe to tag values through the `RW` bridge but cannot write them back. Write-back from embedded HTML/React is a planned feature. Build read-only dashboards, mockups, and visualizations today; designs that need operator-controlled setpoints from embedded content should use native FrameworX input controls (Slider, TextBox, Button with setpoint dynamic) for now.

Design-time preview

In the Designer editor, the control shows a live preview of the configured content:

- **URL mode** with a static URL — the page is fetched and rendered. A dynamic URL shows a placeholder instead ("Dynamic URL will be resolved at runtime").
- **HTML mode** — the content is rendered with a mock `RW` bridge injected. All `data-rw-tag` elements show placeholder values (`12.34`) with the `rw-quality-good` class, and `RW.useTag()`/`RW.subscribe()` calls return the same placeholder data. This lets you verify layout and styling without a running solution.
- **Tag mode** — shows a placeholder ("Content will be loaded from tag at runtime") since the tag value is not available at design time.

Clearing cache

If an HTML5 display using the WebBrowser control fails to load correctly at runtime, clear the WebView2 cache:

1. In the embedded browser, open **More tools Developer Tools** (F12).
2. Open the **Network** tab.
3. Check **Disable cache**.

Alternatively, clear cached files from the browser settings.

HTML5 client parity

On the HTML5/Web client (OpenSilver + WebAssembly), the WebBrowser control maps to an OpenSilver web frame rather than an embedded WebView2. URL mode and inline HTML rendering work on both runtimes. The `RW` JavaScript bridge and `data-rw-tag` auto-binding target feature parity with the WPF runtime, but parity is an active area — complex React content that works in WPF may need adjustment on HTML5. When authoring embedded web content that must run on both, validate on both runtimes before shipping.

Security considerations

- **Content origin.** In `Url` mode, the control navigates to whatever URL you supply. Treat it the same as any browser — don't navigate the control to untrusted pages.
- **Browser storage.** `EnableBrowserStorage` gives the content a persistent origin. Only turn it on when the embedded content actually uses `localStorage`, `sessionStorage`, `IndexedDB`, or similar APIs.
- **CSP on HTML5 deployment.** When the hosting page is served to the HTML5 client and the embedded URL is on a different origin, the hosting server's `Content-Security-Policy: frame-ancestors` header may need to permit framing. Not relevant on the WPF runtime.

When to use which mode

Situation	Mode
Embedding an existing web app, report, or intranet page	URL
HTML content that varies per asset / recipe / operator and is generated elsewhere	Tag
Hand-authored mockup or Claude Design export, with live tag values	HTML (with `data-rw-tag`)
Small React component reacting to tag updates	HTML (with React + `RW.useTag`)
Custom chart or visualization that FrameworX primitives don't cover	HTML (SVG or Canvas + `RW.subscribe`)

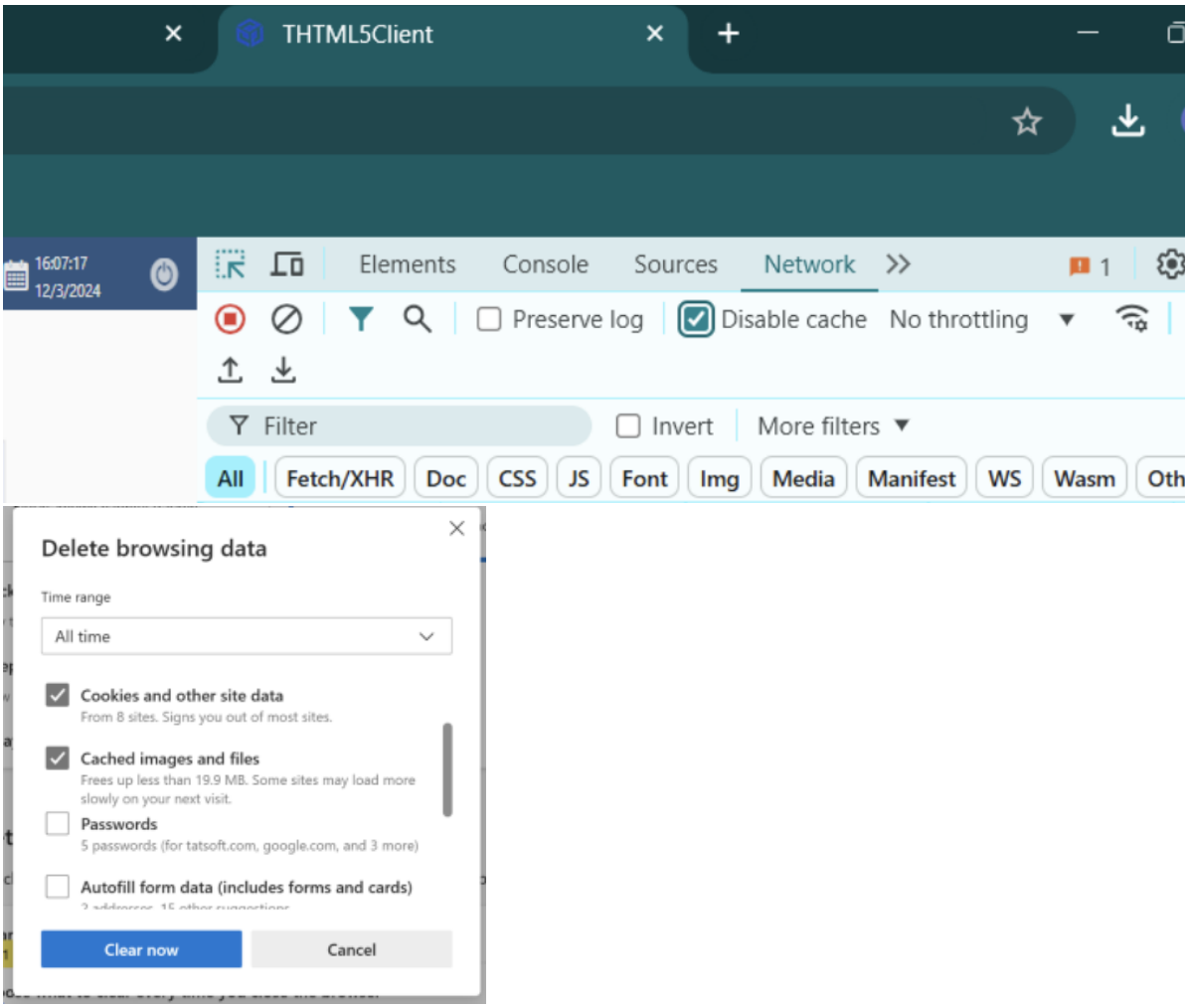
Related

- See **WPF Client overlay limitations (HWND-hosted controls)** for the shared airspace constraint — on the WPF Client, WPF visuals (buttons, popups, headers) cannot overlay this control.
- **Skill Display Construction — Embedded Web** — workflow guide for using Claude Design output with this control, and for deciding between an embedded-web prototype and native FrameworX elements.
- **Skill Display Construction — Basics** — the native display authoring baseline (Canvas and Dashboard paradigms, elements, dynamics).
- **ChildDisplay Control Reference** — for embedding another FrameworX display (rather than web content) inside a display.

Clearing Cache Step by Step

Sometimes when running WeBrowser with a HTML5 display, the connection doesn't load properly. To fix that, as well as other display issues, we recommend clearning the cache from the WebBrowser.

To do that, go to “More tools”, “Development Tools”, “Network”, “Disable Cache”, or, in the browser settings, clear the cached files.



In this section...
