



**COPADATA**  
do it your way

# zenon manual

## zenon Web Server

v.7.50





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# 1. Welcome to COPA-DATA help

## GENERAL HELP

If you cannot find any information you require in this help chapter or can think of anything that you would like added, please send an email to [documentation@copadata.com](mailto:documentation@copadata.com) (<mailto:documentation@copadata.com>).

## PROJECT SUPPORT

You can receive support for any real project you may have from our Support Team, who you can contact via email at [support@copadata.com](mailto:support@copadata.com) (<mailto:support@copadata.com>).

## LICENSES AND MODULES

If you find that you need other modules or licenses, our staff will be happy to help you. Email [sales@copadata.com](mailto:sales@copadata.com) (<mailto:sales@copadata.com>).

# 2. zenon Web Server

With zenon Web Server, visualization content can be called up and displayed with a web browser. In doing so, no installation of zenon Runtime is necessary on end devices. All components for the display of the user interface on the end device are provided automatically. Additional web clients can thus be incorporated into the system dynamically.

zenon Web Server, Web Server Pro and Web Server Pro Light constitute the complete scope of functions of a zenon visualization. A web browser plug-in required for this can be installed automatically the first time the web client is started.

The HTML web engine provides zenon visualization content in the HTML5 web standard. Selected functionalities (on page 84) can be applied.

### 3. zenon Web Server, Web Server Pro and Web Server Pro Light

zenon Web Server is currently available in three different versions: Their functions are briefly described in the following:



#### License information

zenon Web Server, zenon Web Server Pro and zenon Web Server Pro Light require a license to run. For more details, see the Licensing (on page 35) chapter.

#### ZENON WEB SERVER:

- ▶ Forwards data packets from the Primary Server via the zenon Web Server to the zenon Web Client.
- ▶ Handles licensing.
- ▶ Only acts as a viewer.  
This means: No operations are possible, with the exception of screen switching, logging in and logging out.
- ▶ Can be installed on a separate computer, such as in a DMZ for example.
- ▶ Supports network encryption.
- ▶ Supports HTTP tunneling.
- ▶ Many clients possible (depending on the license).

#### ZENON WEB SERVER PRO:

- ▶ Same functionality as zenon Web Server, except:
  - Allows active user actions with zenon Supervisor and zenon Operator Runtime.
- ▶ Start and operation under Windows CE are subject to certain limitations.
- ▶ Can be installed on a separate computer, such as in a DMZ for example.
- ▶ Supports network encryption.
- ▶ Supports HTTP tunneling.
- ▶ Many clients possible (depending on the license).

**ZENON WEB SERVER PRO LIGHT:**

- ▶ Allows active user actions with zenon Supervisor and zenon Operator Runtime.
- ▶ The Primary Server that zenon Web Client connects to must be the same computer on which zenon Web Server Pro Light runs.  
**Note:** For projects with redundancy, zenon Web Server Pro Light must be implemented redundantly - one instance on the Server and one on the Standby Server.
- ▶ Maximum 3 clients.
- ▶ No support for encrypted network traffic. It does not start or it ends itself with encrypted communication.
- ▶ HTTP tunneling is not supported.
- ▶ Projects must run on the same computer as the "server". Projects that run on this computer as a client are not supported.
- ▶ Multiple projects are supported if all projects run locally as a server.

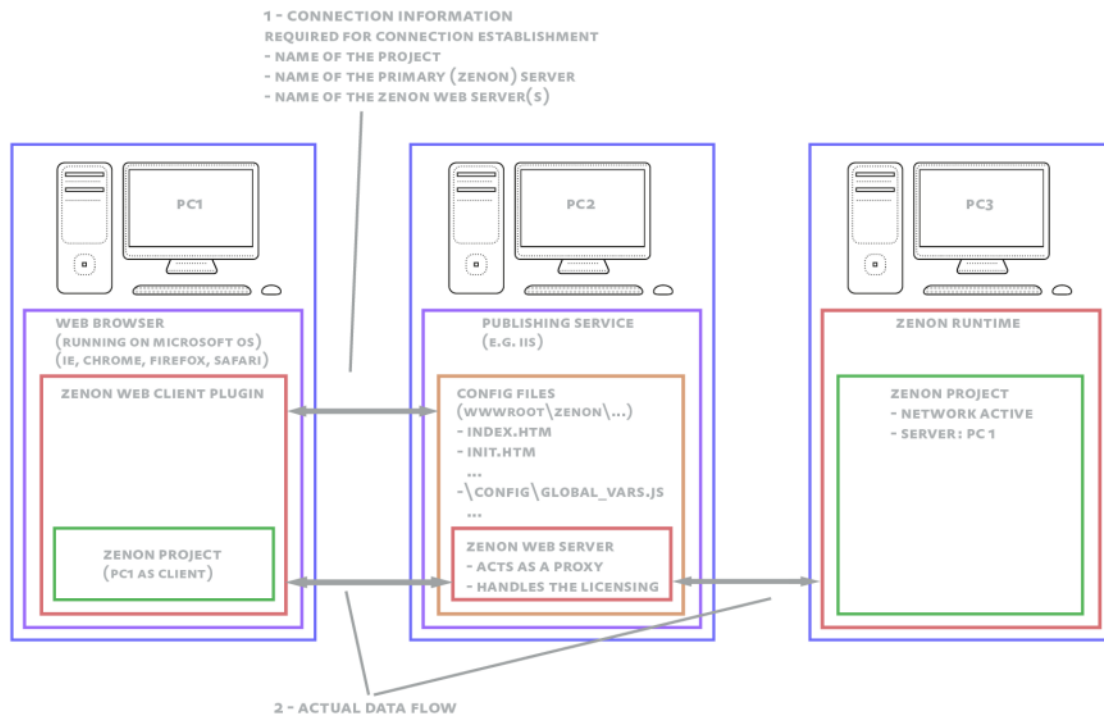
**Note:** zenon Web Server is supplied as a 32-bit application up to zenon 7.10. From version 7.11 onwards, it has also been available as a 64-bit application.

### **3.1 Example of configuration with zenon Web Server:**

From PC1, you connect as a client via the Web Server to PC2 as a gateway, to the Primary Server, i.e. to PC3 (see the following illustration). With the help of zenon Web Server and zenon Web Client, the project can be displayed on PC1 in a web browser by PC3, without an additional local installation of Runtime being necessary on PC1. The following installations are necessary for this function:

**Note:** The following arrangement of components is merely a recommendation. You are free to decide which components are installed on which computer. However it must be noted that a web client for a project **A** cannot be used on a computer that is the server for project **A**.

Furthermore: When using zenon Web Server Pro Light, this must be installed on the computer on which Runtime is running. This is PC3 in our example.



1. **PC1:** Install **zenon Web Client** (on page 20) and the **web browser** (on page 44) on this computer.
2. **PC2:** Install the **publishing service** (on page 10) and **zenon Web Server** (on page 12) on this computer.

**Note:** With regard to the publishing service, this handbook relates to the IIS Publishing Service. If the IIS Publishing Service is installed on this computer, the home page for the zenon Web Client is configured automatically. However there are also alternative publishing services, such as the one from Apache. You are free to decide which of these you use. Furthermore, there is the possibility to not have the publishing service at all. However in this case there are additional steps that you have to carry out manually. You can find these steps in detail in the Publishing service (on page 10) chapter.

3. **PC3:** **zenon Runtime** and the **project** must be on this computer, and optionally also the **zenon Editor**.

**Note:** If zenon Web Server is not licensed, it starts in demo mode. The automatic start with the operating system does not happen in this case and the web server must be started manually via

the user interface. The session is automatically ended after 30 minutes. A maximum of 2 clients can connect to it.

Configuring the individual components:

Configuration is usually still necessary after installation. For example, after installation of zenon Web Server on PC2, the `global.vars` file is important. This file is, among other things, automatically installed as well and still needs some amendments. For details, read the **global\_vars.js settings** (on page 15) chapter.

The Runtime project on PC3 requires the following basic settings (on page 30) in the zenon Editor:

- ▶ Project property -> Network -> Activate active network.
- ▶ Enter project property -> network -> **Server 1** -> computer (name) with Runtime.

If you have finished the installation and configuration, you can have Runtime displayed on **PC1**. To do this, you open a web browser and enter: `RechnernamePC2\zenon\index.htm`

## 3.2 Required components and their definitions

Components	Description
<b>Primary Server</b> (on page 7)	The server on which Runtime, the Editor and the project is running and to which a client connects via the zenon Web Server.
<b>zenon Web Server</b> (on page 6)	Forwards data packets from the Primary Server via the zenon Web Server to the zenon Web Client. Also handles licensing. Cannot write values.
<b>zenon Web Server Pro</b> (on page 6)	Allows active user actions with zenon Supervisor. Starting and operation with Windows CE is subject to certain limitations.
<b>zenon Web Server Pro Light</b> (on page 6)	Allows active user actions with zenon Operator and zenon Supervisor.
<b>Publishing service</b> (on page 10)	For publishing documents, such as HTML pages, via the HTTP protocol.
<b>zenon Web Client</b> (on page 20)	The zenon Web Client is a program that runs in a standard web browser and displays a project. It connects to a Primary Server using a zenon Web Server. It shows the project of the Primary Server, just as a normal client would do. Only difference: With the zenon Web Client the project is displayed in a browser.
<b>Web browser</b> (on page 44)	Web browsers are special computer programs for the display of web sites in the World Wide Web or the general display of documents and data. Source: <a href="http://de.wikipedia.org/wiki/Webbrowser">http://de.wikipedia.org/wiki/Webbrowser</a>

Administrator rights are required for installation or configuration of zenon Web Server, zenon Web Client and the publishing service.

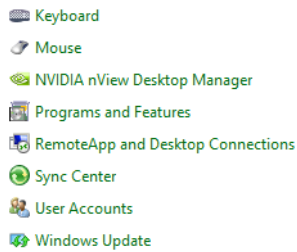
**Note:** No administrator rights are required for normal operation. The normal user rights are sufficient.

### 3.2.1 Publishing service installation

If you use a Windows operating system on your computer, it is no longer necessary to install the publishing service. This need only be activated via Windows features. The following example relates to the IIS Publishing Service. However others can also be used, such as the one from Apache. In this case, the file storage locations may be different. Please note the following info box in this case.

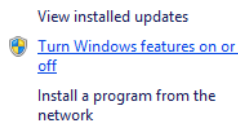
To activate the IIS Publishing Service, proceed as follows:

1. Open the Control Panel of your PC.
2. Click on **Programs and Features**.

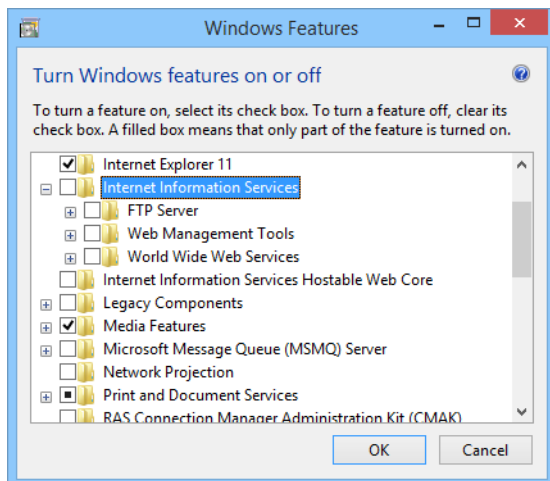


**Note:** The arrangement of the icons in the Control Panel may look different on your computer.

3. Click on **Turn Windows features on or off**.



4. Activate the **Internet Information Services** option
5. Activate all **World Wide Web Services** there.



If the services have been activated successfully, you will find the following folder in the root directory:  
C:\inetpub\wwwroot



### Info

*If the zenon Web Server was already installed before the publishing service or if a different publishing service is used, the folder created during installation of the Web Server `C:\Program Files (x86)\COPA-DATA\zenonWebserver\zenon` must be moved manually to `C:\inetpub\wwwroot` or to the root folder of the alternative publishing service.*

*Note: The publishing service provides easier access to the configuration files for the web browser. However if the configuration files are accessible locally or in the network, the publishing service need not be used at all.*

## 3.2.2 zenon Web Server Installation

Note the following criteria when selecting the computer for the Web Server and the publishing service:

- ▶ TCP communication from the Web Server to the Primary Server must be possible.
- ▶ There must be complete naming resolution between the Web Server and the Primary Server in the network.

**Hint:** If the Web Server is to be contactable from outside, it is strongly recommended that a VPN connection is used and the Web Server and the computer with the publishing service is placed in a DMZ.

It is recommended that the zenon Web Server is installed on the same computer on which you have activated and installed the publishing service.

To do this:

1. Start the installation from the installation medium.
2. Follow the instructions given to you by the installation wizard.
3. Restart the computer

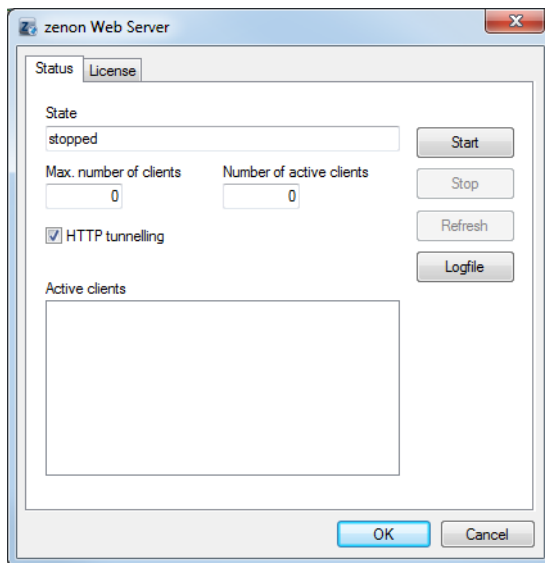
The `zenon` folder is automatically created in the **wwwroot** folder of the IIS publishing service. This folder contains, among other things, some important configuration files that must be installed. For example, `global_vars.js` is an important file. You must amend some settings in this file. Read more about this in the zenon Web Server configuration (on page 12) chapter.

### zenon Web Server configuration/start

To configure the Web Server, or start it manually:

1. Open the **Control Panel** or the **Start Menu**.
2. Click on **zenon Web Server**.

The dialog for configuration and licensing (on page 35) opens:



Note: This dialog is only available in English.

3. Select a connection via TCP or HTTP

**Attention:** Only activate the option for `HTTP tunneling` if you have also explicitly configured all web clients for this. TCP is used as a standard.

4. Click on the **Start** button to start the web server manually.

**Note:** In normal operation, zenon Web Server is automatically started with the computer as a Windows service. If it has been closed or if you are in the process of entering a new license number, it must be restarted manually. If there is no valid license, the Web Server is not started as a service but in demo mode via the dialog.

Parameters	Description
<b>State:</b>	<p>Displays version and status of the Web Server:</p> <p>Possible versions:</p> <ul style="list-style-type: none"> <li>▶ zenon Web Server</li> <li>▶ zenon Web Server Pro</li> <li>▶ zenon Web Server Pro Light</li> </ul> <p>Possible status messages:</p> <ul style="list-style-type: none"> <li>▶ <code>running:</code> Web Server is running with valid license</li> <li>▶ <code>stopped:</code> Web Server stopped:</li> <li>▶ <code>Demo mode:</code> Web Server is running in demo mode without license</li> <li>▶ <code>not installed:</code> Web Server not registered as service or installation error</li> </ul>
<b>Max. number of clients:</b>	<p>Maximum number of clients that are permitted to connect to the Web Server. The number is defined by the license.</p> <p>Two clients are licensed for 30 minutes in demo mode.</p> <p>Default: 0</p>
<b>Number of active clients:</b>	Displays the number of clients currently connected.
<b>Start</b>	Starts the Web Server
<b>Stop</b>	Stops the Web Server
<b>Refresh</b>	Refreshes the display.
<b>Diagnosis Viewer</b>	Opens the Diagnosis Viewer.
<b>HTTP tunnelling</b> (on page 41)	<p><code>Active</code>: HTTP tunneling is activated.</p> <p>Not available in the Web Server Pro Light version.</p> <p><b>Note</b>: Can only be changed if the Web Server has the status <code>stopped</code>. Cannot be switched during operation.</p> <p>Default: <code>Inactive</code></p>
<b>Active clients</b>	List of connected clients.
<b>OK</b>	Applies settings and closes the dialog.
<b>Cancel</b>	Discards the changes and closes the dialog.

## STARTING AND CONFIGURING UNDER WINDOWS CE.

There is no start dialog for Windows CE. zenon Web Server is already integrated into Runtime.

*To start zenon Web Server under Windows CE, the following must be the case:*

- ▶ The `Network active` property must be activated in the project,
- ▶ Runtime must have been started,
- ▶ zenon Web Server must be licensed

**Note:** HTTP tunneling is not available with Windows CE.

With Windows CE, the functionality is subject to all the limitations that are generally applicable for Windows CE and zenon Web Server under Windows CE.



### Information

No publishing service is installed with Runtime and the integrated Web Server. However any desired publishing service can be used on a Windows computer with the corresponding configuration files.

## Configuration of the `global_vars.js`

The connection parameters that are required to establish the connection from the web client to the Primary Server are in the `global_vars.js` configuration file. You can find this file when using the IIS publishing service in the `C:\inetpub\wwwroot\zenon\config\` folder on the computer on which the IIS publishing service runs.

Amend the content of this file in a text editor. You can also find notes on the required content in the comments text.

## CONTENT OF `GLOBAL_VARS.JS`:

```
// Please enter here the string name of your project and make sure that it is
identical with the project name in the Editor

var PROJECTNAME = "PROJECT";

// Please enter here the computer name, on which the zenon Runtime is installed
and on which it is actively running

// For redundant Runtime servers, please enter both "server1;server2"

var RUNTIMESERVER= "Runtime server";

// Please enter here the computer name, on which you have installed the zenon Web
Server
```

```
var WEBSERVER    = "Webserver";

// Please enter here an optional initial function to be executed when the Web Client
// connects to its server. Defaultvalue = "Init"

var INITFUNCTION = "Init";

// Optional: Please enable the zoom feature (This step will stretch the project
// resolution to the size of the Web Client control) OFF = "0" / ON = "1"

var ZOOM = "0";

// Please enter the version number corresponding to the Web Client.

var VERSION    = "7,20,0,0";

// Optional: Please enable HTTP tunnelling feature: 0 = inactive (available on
// Web Client version 7.00 and higher)

var HTTP = "0";
```

## PARAMETERS

Parameters	Description
<b>PROJECTNAME=</b>	<p>Defines the name of the Runtime project.</p> <pre>var PROJECTNAME = "PROJECT NAME";</pre> <p><b>Note:</b> The project must as a server project on the stipulated Runtime server.</p>
<b>RUNTIMESERVER =</b>	<p>Denotes the target computer on which Runtime for the project runs.</p> <ul style="list-style-type: none"> <li>▶ Standalone: <pre>var RUNTIMESERVER = "SERVE RNAME";</pre></li> <li>▶ Network project (on page 20): <pre>var RUNTIMESEVER = "Runtime server; Runtime server2"</pre> <b>Note:</b> Runtime server = <b>Server 1</b>; Runtime server2 = <b>Server 2</b></li> </ul> <p>The name must correspond with the server name in the project configuration.</p> <p><b>Note:</b> The IP address must not be used here. There must be naming resolution between the computer with the Web Server and the Primary Server in the network in both directions. Pinging the name must produce identical results on both computers.</p> <p>You can find further information on the correct configuration of the web server when operating a redundant network in the web client in the redundant network (on page 20) chapter.</p>
<b>WEBSERVER=</b>	<p>Denotes the target computer on which zenon Web Server was installed.</p> <p><b>Attention:</b> That is not the publishing server!</p> <pre>var WEBSERVER = "WEBSERVER";</pre> <p><b>Web Server redundancy</b></p> <p>If, in addition to zenon Primary Server, the zenon Web Server is also to be operated as redundant, the following must be the case:</p> <ul style="list-style-type: none"> <li>▶ two copies of zenon Web Server are installed and licensed on different computers</li> <li>▶ both copies of zenon Web Server, separated by a comma, are entered in the variable declaration on the HTML page: <pre>var WEBSERVER = "WEBSERVER, WEB-STANDBY-SERVER";</pre></li> </ul> <p><b>Note:</b> Instead of the name of the computer with the Web Server, the IP address of the computer with the Web Server can also be used here. If the Web Server is behind an NAT router and Port Forwarding is</p>

	configured on the computer with the Web Server, the IP address of the NAT router can also be used.
--	--

<b>INITFUNCTION=</b>	<p>Defines a zenon function that is executed when a project is started in the browser.</p> <p>This setting is optional.</p> <p><b>var INITFUNCTION = "Init";</b></p> <p><b>Note:</b> The wording must correspond to the function names in zenon (capitalization).</p>
<b>ZOOM=</b>	<p>Defines if the project can be zoomed in or out of in the browser view.</p> <p>This setting is optional.</p> <p><b>var ZOOM = "VALUE";</b></p> <p>0: OFF 1: ON</p> <p>Default: 0 : OFF</p> <p>For example:</p> <p><b>var ZOOM = "0";</b></p> <p><b>Note:</b> The zoom adjustment is only considered on initializing, not when the Runtime is running. If a certain size is wanted, it has to be defined by the ActiveX control. If you do not open the browser window as maximized and then maximize it later, this can lead to display problems.</p>
<b>var VERSION=</b>	<p>Defines the zenon Web Client version.</p> <p><b>var VERSION = "VALUE";</b></p> <p>for example:</p> <p><b>var VERSION = "7,20,0,0";</b></p> <p>This must always be the same or higher than the version of zenon Runtime.</p>
<b>var HTTP=</b>	<p>Defines type of communication and allows communication via HTTP. If this property is deactivated, communication is via TCP/IP</p> <p>This setting is optional.</p> <p>0: inactive 1: aktiv</p> <p>Default: 0 : inactive:</p> <p><b>Note:</b> You can find further information in the HTTP tunneling (on page 41) chapter in this manual.</p>

Note: When entering parameters in the `global_vars.js` file, note capitalization.

### zenon web client in the redundant network

With a redundant zenon network configuration, the issuing of roles for the primary server and standby server depends on the redundancy type. It is not always clearly recognized whether the configured **Server 1** or **Server 2** is in the role of the Primary Server.

You should therefore configure both servers for the web server. You configure this configuration in `global_vars.js` with the **RUNTIMESERVER=.** entry

In doing so, the sequence should conform to the configuration in the zenon Editor:

- ▶ `Runtime server = Server 1`
- ▶ `Runtime server2 = Server 2`

The zenon thus attempts to contact both servers after one another. If, for example, the configured `Runtime server2` is the Primary Server, it sends the data (including the `project.ini` file) to the client.

### AMENDED SERVER CONFIGURATION

If the server names configured in the Editor do not correspond to the server names of `global_vars.js`, the web client or the client Runtime will not start.

If the configuration of the server is amended for a running system in zenon, the "Runtime is busy" dialog will be shown in the zenon web client.

After a project synchronization, the currently-running and the actual project configuration will be shown in a further dialog. In this case, the browser window must be closed by the user and the web client must be restarted.



#### Attention

*If the project configuration of **Server 1** and **Server 2** is amended in the zenon Editor, the `global_vars.js` file must also be amended accordingly.*

*You can find further information in the zenon web server (on page 5) manual in the configuration of `global_vars.js` (on page 15) chapter.*

## 3.2.3 zenon Web Client Installation

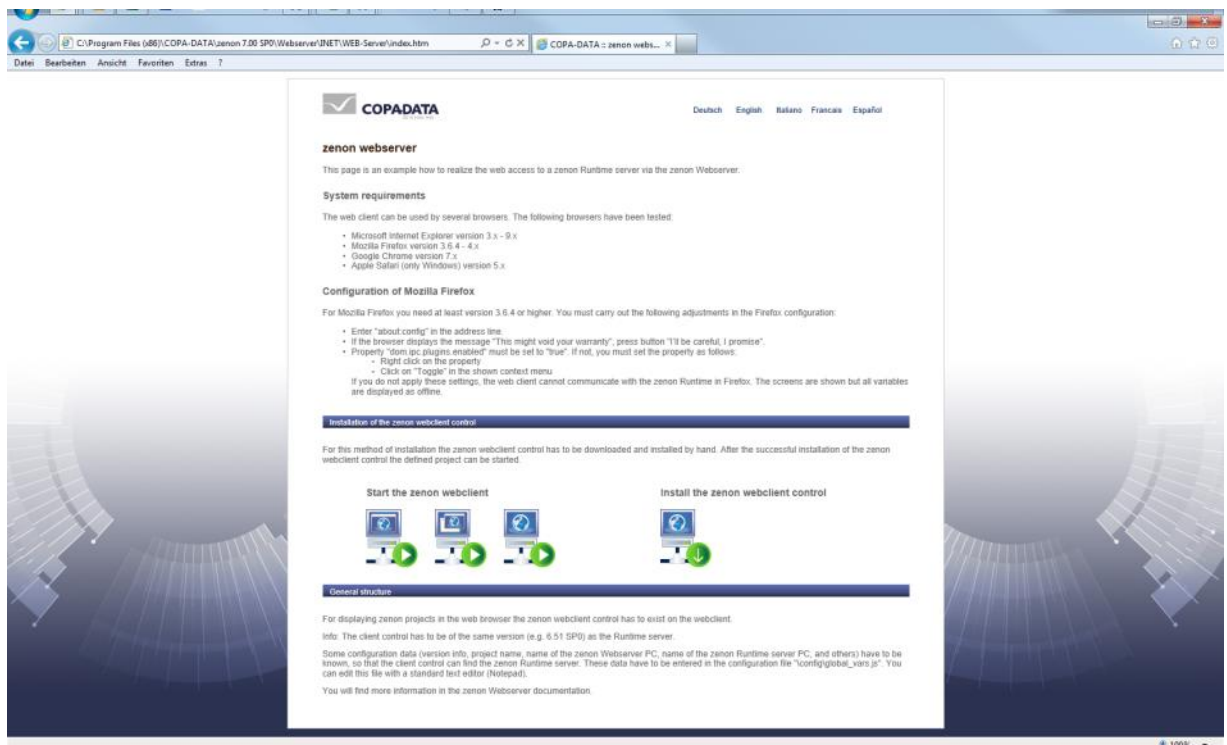
There are four possibilities for installation of zenon Web Client as a 32-bit application.

Note: It is recommended that you carry out the installation using the first possibility.

## 1. VIA THE INDEX.HTM PAGE:

It is recommended that you carry out the following steps on the computer on which the Publishing service has been installed or activated. It is PC2 in this example. For details, see the screen in the Example configuration with zenon Web Server (on page 7) chapter. However the Web Client is not necessarily required on this computer. You are free to choose the computer.

1. Start the `index.htm` page by entering the following in the web browser:  
`http://Publishingserver//zenon/index.htm`



2. Then click on the **Starting the zenon Web Client** icon.
3. The WebClientSmall setup must be carried out first.

**Note:** Administrator rights are required for this. The WebClientSmall setup also requires an Internet connection during installation, in order to download further components. If your computer does not have an Internet connection, use the major installation and one of the other methods of installation.

4. The `init.htm` page continues to be called up by the `index.htm` page.
5. The `init.htm` uploads the Javascript files. These then load the zenon Web Client plug-in.

**Note:** If you need the larger file from the Web Client, you must amend the `index.htm` page manually. You can read more about this in the `index.htm` (on page 26) chapter.

You can also, as an option, open the `index.htm` page from the `zenon` folder. This folder is automatically created in the `wwwroot` directory when the Web Server is installed.

## **2. VIA COPY AND PASTE**

After installation of the Publishing service (IIS) and the zenon Web Server, the installation files for the zenon Web Client are in the subdirectory.

`C:\inetpub\wwwroot\zenon\controlversions\version720SP0\WebClient.exe` or `WebClient_small.exe`.

Copy the `WebClient_small.exe`. or `WebClient.exe`. application from there.

1. Add these into your preferred local save location.
2. Install the application.

## **3. VIA THE START INSTALLATION MEDIUM:**

1. Copy, from the folder  
    `...\Setup\wwwroot\controlversions\version720SP0\WebClient.exe`, the `WebClient.exe` or `WebClient_small.exe` application.
2. Add these into your preferred local save location.
3. Install the application.

**Note:** zenon Web Client primarily consists of an ActiveX control. This provides the information in a browser exactly as in a normal Runtime client. The connection to the Runtime server is implemented with zenon Web Server. zenon Web Client logs errors in the local diagnosis server. The diagnosis server is also installed when zenon Web Client is installed.

## **4. VIA THE INIT.HTM PAGE:**

Start the web browser and go to the `init.htm` page, in which you enter the following:

`http://Publishingserver/zenon/init.htm`

1. From there, start the `WebClient.exe` application

**Note:** The number of web clients that can be used at the same time depends on your license.

**Attention:** This may need to be added as a "**trusted site**" in the Internet Explorer settings under Extras -> Internet options -> Security.

To do this:

- ▶ Open the web browser.
- ▶ Click on **Internet Options**.
- ▶ Click on **Security**.

- ▶ Click on **Trusted sites**
- ▶ Click on **Sites**.
- ▶ Enter the page.

### zenon Web Client - compatibility

With the zenon Web Client, you access different versions of Runtime, along the lines of Runtime compatibility. The version number of the Web Client must only be the same or higher than the Runtime version.

The Runtime online compatibility makes interoperability of Runtime systems (also via Web Clients) in the zenon network possible even if the version of the client Runtime is higher than the version of the server Runtime.

The current Runtime can load projects of the following versions:

- ▶ 6.20 SP4
- ▶ 6.21 SP0
- ▶ 6.21 SP1
- ▶ 6.22 SP0
- ▶ 6.22 SP1
- ▶ 6.50 SP0
- ▶ 6.51 SP0
- ▶ 7.00 SP0
- ▶ 7.10 SP0
- ▶ 7.11 SP0

Due to the multi-project administration projects from different versions can be loaded. For example the Integration project can have version 7.11, a sub-project version 7.00 and another sub-project version 6.51.

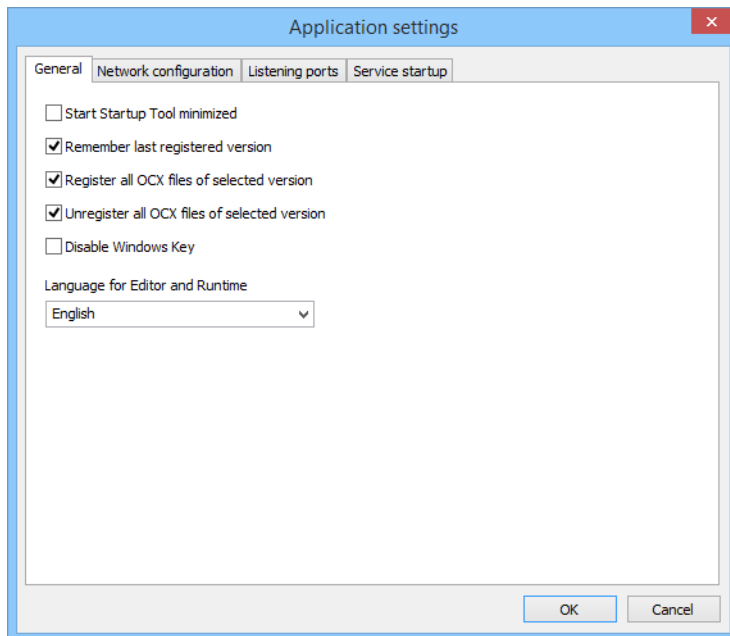


#### Information

*It is best to always use the zenon Web Client with the highest Service Pack number within a version.*

## Language setting of zenon Web Client

### TO CONFIGURE THE LANGUAGE FOR THE WEB CLIENT:



1. Start the `Startup Tool`.
2. Select the `General` menu entry.
3. Select the desired language in the `Language for Editor and Runtime` drop-down list.

### AVAILABLE LANGUAGES FOR THE WEB CLIENT:

- ▶ Chinese
- ▶ German
- ▶ English
- ▶ French
- ▶ Italian
- ▶ Russian
- ▶ Spanish
- ▶ Czech



### Information

You can get further information for the language setting in the Startup Tool in the Tools manual in the General chapter.

## Creation of the HTML page for the project entry

A project start page (on page 26) is required, so that the web browser can start zenon Web Client and then connect to the corresponding Primary Server. This page contains the necessary code. Java Script is used as a script language.

### Requirements:

- ▶ JavaScript must be activated in the browser.
- ▶ The zenon Web Client must also be installed locally on the computer on which the web browser is executed.

**Recommendation:** Switch, before the project entry page (init.htm) (on page 25), to a start page (index.htm) (on page 26), that allows the download of the Web Client. This start page contains hyperlinks:

- To download the zenon Web Client controls
- To project entry page **init.htm**, which carries out a browser check and makes the connection from zenon Web Server to the Primary Server.

## Example of project start page init.htm for TCP and HTTP

On the project entry page (on page 26), a browser check checks to see which browser the Web Client uses. Depending on the result, the Web Client is started or an error message is given.

### Example of project start:

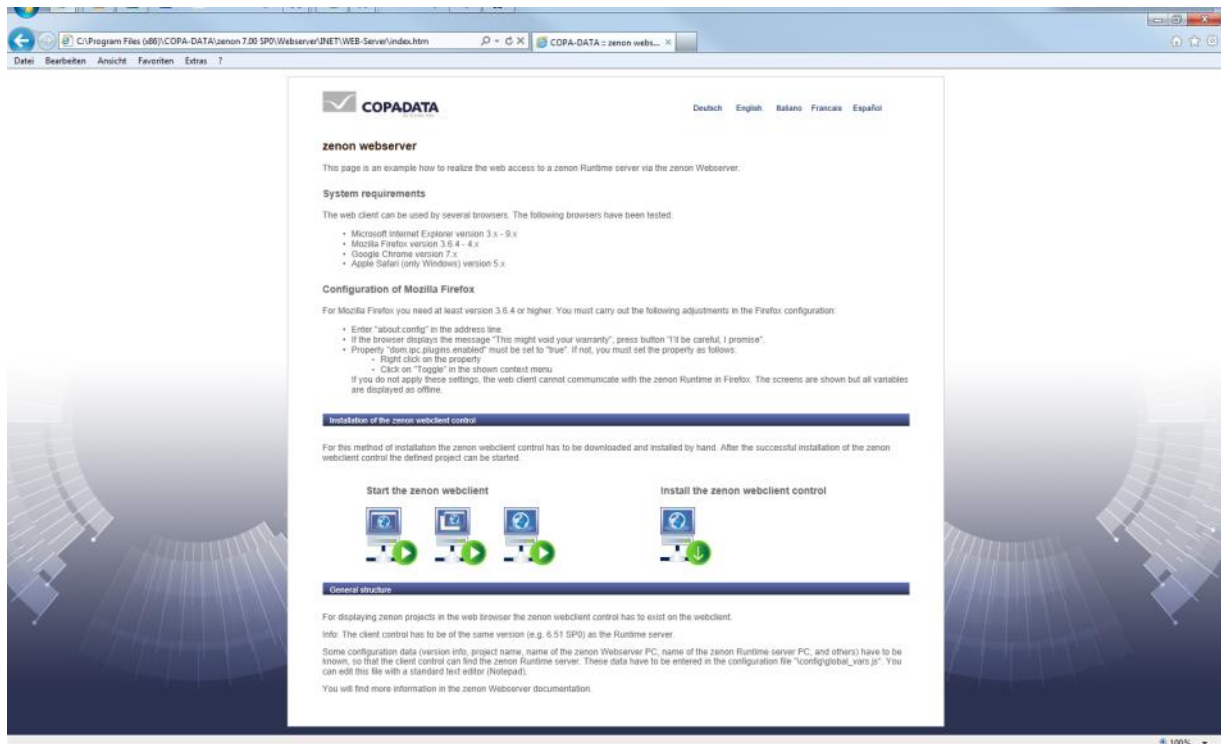
The start page (on page 26) calls up three scripts in order to check the browser used and either to establish a connection to Runtime or to issue an error message:

- ▶ global\_vars.js (on page 15): Defines values of transfer parameters to start the Web Client
- ▶ browsercheck.js (on page 28): Checks the version of the browser
- ▶ initcode.js (on page 28): Defines functions that are used to start the Web Client

**Note:** The settings only differ for connections using TCP and HTTP in terms of the **UseHTTP** entry.

## index.htm

The page **index.htm** is the start page for our example. It starts by default in English and can be switched to other languages directly on the page on the top right.



The page **index.htm**:

- ▶ Informs you about compatible browsers
- ▶ Offers links to start the zenon Web Clients
- ▶ Offers a link to the installation of zenon Web Client controls; this is necessary if zenon is not installed on the computer with the Web Client
- ▶ Calls up the project entry page **init.htm** (on page 25) when the Web Client is started, which carries out the browser check

## init.htm

The **init.htm** file checks the browser being used and then either starts the project or gives an error message.

Scripts are used for this:

1. The configuration is loaded from **global\_vars.js** (on page 15).

2. The browser is determined by **browsercheck.js** (on page 28).
3. If it is a supported browser, the appropriate function to include the zenon Web Client from **initcode.js** (on page 28) is executed.

**EXAMPLE:**

```
<html>
<head>
<title></title>
</head>
<BODY scroll="no" leftmargin="0" topmargin="0" marginwidth="0" marginheight="0"
BGCOLOR=#FFFFFF>
<script language="javascript" type="text/javascript" src="global_vars.js"></script>
<script language="javascript" type="text/javascript" src="browsercheck.js"></script>
<script language="javascript" type="text/javascript" src="initcode.js"></script>
<script language="JavaScript" type="text/javascript">
switch(browsercheck()) {
    case "IEXPLORER":

        runIexplorer(PROJECTNAME,RUNTIMESERVER,WEBSERVER,INITFUNCTION,ZOOM,VERSION);
        break;
    case "NPAPI":
        runNPAPI(PROJECTNAME,RUNTIMESERVER,WEBSERVER,INITFUNCTION,ZOOM,VERSION);
        break;
    case "UNSUPPORTED_BROWSER":
        alert(navigator.appName + ' : ' + navigator.appVersion + ' is not
supported!');
        break;
    default:
        alert("invalid parameter");
        break;
}
</script>
</html>
```

## browsercheck.js

This JavaScript finds out which browser the Web Client wants to start and gives the result back to **init.htm** (on page 26).

```
function browsercheck(){
    var UserAgent = navigator.userAgent;
    var fWin32 = (UserAgent.lastIndexOf('Win') != -1) &&
(UserAgent.lastIndexOf('Windows 3.1') == -1) && (UserAgent.lastIndexOf('Win16') == -1);
    var fMSIE = (UserAgent.lastIndexOf('MSIE ') != -1);
    var fNPAPI = (UserAgent.lastIndexOf('Firefox/') != -1) ||
(UserAgent.lastIndexOf('Chrome/') != -1) || ((UserAgent.lastIndexOf('Safari') != -1) &&
(UserAgent.lastIndexOf('Version/') != -1));
    if(fWin32)
    {
        //Win32-Browser
        if(fMSIE)
        {
            //Internet Explorer --> use ActiveX-Control
            return "IEXPLORER";
        }
        if(fNPAPI)
        {
            //Firefox, Chrome or Safari --> use NPAPI-Plugin
            return "NPAPI";
        }
    }
    //Non-Win32-Browser or not supported Browser (Opera, ...)
    return "UNSUPPORTED_BROWSER";
}
```

## initcode.js

This Javascript sets:

- ▶ The **<embed>** entry to start zenon Web clients in Apple Safari, Google Chrome or Mozilla Firefox
- ▶ The **<object>** entry to start zenon Web clients in Microsoft Internet Explorer

Script:

```
function runNPAPI(PROJECTNAME,RUNTIMESERVER,WEBSERVER,INITFUNCTION,ZOOM,VERSION) {
    document.write ('<embed type="application/x-zenon">');
```

```

document.write ('    width=100%');
document.write ('    height=100%');
document.write ('    Project="' +PROJECTNAME+ '"');
document.write ('    Server="' +RUNTIMESERVER+ '"');
document.write ('    WebServer="' +WEBSERVER+ '"');
document.write ('    Load="-1");
document.write ('    ScrollV="0");
document.write ('    Scrollh="0");
document.write ('    InitFunction="' +INITFUNCTION+ '"');
document.write ('    Zoom="' +ZOOM+ '"');
document.write ('    UseHTTP = "' +HTTP+ '"');
document.write ('>');
document.write (' </EMBED> ');
}

function runIexplorer(PROJECTNAME,RUNTIMESERVER,WEBSERVER,INITFUNCTION,ZOOM,VERSION) {
    document.write ('<object');
    document.write ('    id="CD_IClient1");
    document.write ('
classid="clsid:2A3BC66B-03D7-11D4-991A-080009ABB492");
    document.write ('    codebase="zenWebCli.ocx#version=' +VERSION+ '"');
    document.write ('    width=100%');
    document.write ('    height=100%');
    document.write ('>');
    document.write ('    <PARAM NAME="Project" VALUE="' +PROJECTNAME+ '">');
    document.write ('    <PARAM NAME="Server" VALUE="' +RUNTIMESERVER+ '">');
    document.write ('    <PARAM NAME="WebServer" VALUE="' +WEBSERVER+ '">');
    document.write ('    <PARAM NAME="Load" VALUE="-1">');
    document.write ('    <PARAM NAME="ScrollV" VALUE="0">');
    document.write ('    <PARAM NAME="Scrollh" VALUE="0">');
    document.write ('    <PARAM NAME="InitFunction" VALUE="' +INITFUNCTION+
'>');

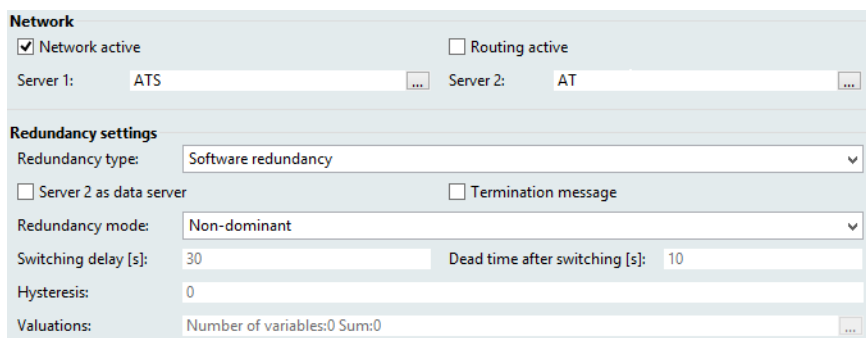
    document.write ('    <PARAM NAME="Zoom" VALUE="' +ZOOM+ '">');
    document.write ('    <PARAM NAME="UseHTTP" VALUE="' +HTTP + '">');
    document.write ('</object>');
}

```

### 3.3 Project configuration

The project that is to be started using zenon Web Server requires the following basic settings in the zenon Editor:

- ▶ Activate the > **Network** -> **Network active** project property
- ▶ Project properties -> **Network** -> **Server 1** -> Name of the computer that acts as a server to Runtime.  
With a redundant configuration, the **Server 2** property must also be configured.
- ▶ This computer name must also be started in the project start page (`globalvars.js` (on page 15) ) so that a connection can be established.




#### Attention

*The configuration for **Server 1** and **Server 2** must correspond in the project and zenon web server. The information must not overlap under any circumstances. That means: **Server 1** in the project must not correspond to **Server 2** on the zenon web server and vice versa.*

#### START UP THE ZENON WEB SERVER:

To put the zenon Web Server into operation:

1. Ensure that the **WWW publishing services** were started and that the **entry page** (on page 25) is ready
2. Start the Runtime project on the computer.
3. Start the **zenon Web Server**.



### Attention

#### VBA/VSTA AND DATA EXECUTION PREVENTION

The operating system also uses the **Data Execution Prevention (DEP)** function to prevent VBA code being executed in the browser.

##### Microsoft Internet Explorer 8 and 9:

Microsoft Internet Explorer version 8 or higher offers the possibility to deactivate DEP for the browser.

- ▶ go to Extras -> Internet options -> Advanced-> Security
- ▶ deactivate the option **Activate memory protection in order to reduce the risk of online attacks**

##### Other browsers and Internet Explorer from Version 10 (from Windows 8)

*DEP must be turned off completely as the browser process cannot be excepted explicitly. This is not recommended due to security issues.*

*to deactivate DEP:*

- ▶ Run the command line with administrative rights
- ▶ Execute the following command:  
**bcdedit.exe/set {current} nx AlwaysOff**
- ▶ restart the computer

*The setting can be undone with the command **bcdedit.exe/set {current} nx AlwaysOn***

*General recommendation: Use VSTA instead of VBA.*

### 3.3.1 General limitations

Projects that are operated using zenon Web Client have the following limitations:

- ▶ Alarms:  
Acknowledgement of alarms is only possible when **zenon Web Server Pro** is used.
- ▶ User Administration  
AD and ADAM/ADLDS only work with certain limitations (as on standard clients too):  
AD: The computers must be in the same domain  
ADAM/ADLDS: The zenon Web Client needs a physical connection to the zenon Web Server (plus an open port) and to the ADAM/ADLDS server
- ▶ Screens:

- The screen of type Archive revision is not available.

► Print:

Before the first printing on the zenon Web Client the function **Select printer** has to be executed. Here the printers for the client can be defined. These settings are saved in the `zenon6.ini` so that this procedure does not have to be executed again with each new print job.

► IPA:

The Industrial Performance Analyzer (IPA) module is only available on zenon Web Clients in an intranet, because no connection can be made to the database via the internet. If there is an intranet connection, the database authorizations have to be set accordingly, so that a remote computer can access the database as a zenon Web Client.

► Menus

On the zenon Web Client Main menus are not displayed.

► Monitor Administration:

The Monitor Administration works only with limited functionality. The web client can only be operated with one monitor.

► PFS:

The Production & Facility Scheduler (PFS) is only available in versions 6.01 or higher.

► Status information:

The status information, which is displayed by pressing the right mouse button, is not available.

► Keyboard combinations:

The key combinations on buttons like e.g. F3 are not available.

► VBA:

VBA is only available if VBA has been installed on the zenon Web Client manually. For detailed information, please contact zenon Support.

**Note:** VBA macro message boxes are not shown in the web client when Internet Explorer is used.

► VSTA: zenon Web Server and zenon Web Client support different versions of VSTA.

In general, zenon Web Client supports VSTA, with the exception of:

- Debugging
- **Display VSTA editor** function
- Compiling

For details, see the VSTA with zenon Web Client, zenon Web Server and zenon Web Server Pro (on page 46) chapters.

► zenon Logic is not supported by the zenon Web Client.

#### ADDITIONAL RESTRICTIONS FOR WINDOWS CE:

- ▶ A maximum of three zenon Web Clients can be connect with a CE Runtime simultaneously.
- ▶ The zenon Web Server must be running on the same device as the CE Runtime to which it is connected. It is not possible to connect to a CE Runtime on another device.

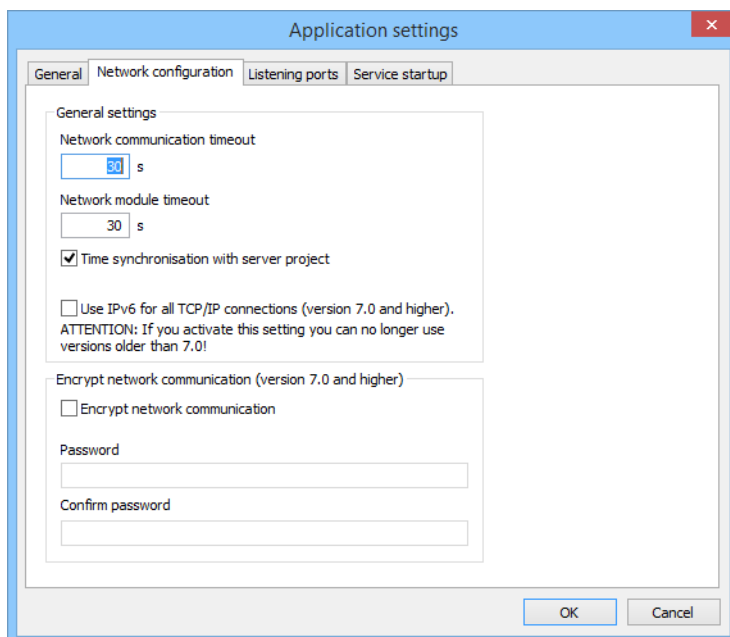
The zenon Web Server for CE is licensed via the Remote Licensing.

### 3.3.2 Encryption of the communication in the network.

From zenon version 7, communication in the network can be protected with strong encryption. From zenon version 7.11, the configuration for the encryption of the communication of the Web Server has been integrated into the Startup Tool.

#### TO ACTIVATE ENCRYPTION IN THE WEB CLIENT:

1. Start the Startup Tool
2. Select the **Options...** menu entry
3. Switch to the **Network configuration** tab
4. Activate the **Encrypt network communication** checkbox to activate encrypted Web Client communication.





### Information

*You can get further information for the network configuration in the Startup Tool in the Tools manual in the Network Configuration chapter.*

## 3.4 IPv6

As of zenon version 7 you can use IPv6 in the network.



### Information

With IPv6, more users and devices can communicate via the Internet in that they use greater numbers to create IP addresses. With IPv4, each IP address is 32- bits long, as a result of which 4.3 billion unique addresses can be formed. Example for an IPv4 address:

172.16.254.1

For comparison: IPv6 addresses are 128- bits long, which allows formation of approximately 340 sextillion ( $3,4e+38$ ) unique IP addresses. Example of an IPv6 address:

2001:db8:ffff:1:201:02ff:fe03:0405

However IPv6 offers other advantages for network traffic. In most cases, computers and programs recognize IPv6-compatible networks and use the corresponding advantages without the user having to do anything more. IPv6 also frees other network problems that can occur due to the limited addressing area of IPv4. Example: IPv6 reduces the necessity of network address translations (NAT), a service that allows several clients to use a joint IP address, but which does not always work reliably.

The zenon network allows the choice of using IPv6 or IPv4. Dual operation is not possible. The setting is made via:

- ▶ Network configuration in the Startup Tool  
or
- ▶ In zenon6.ini

**Attention:** IPv6 only works with version 7 onwards.

No versions prior to version 7 can be started if this is active. This concerns **zenAdminSrv**, **zenSysSrv**, **zenLogSrv** und **zenDBSrv** in particular.

The following components are not affected by the setting; they always use IPv4:

- ▶ Driver communication with the PLCs
- ▶ Protocol communication in the Process Gateway plug-ins
- ▶ Workbench and Runtime communication in zenon Logic

## DIAGNOSIS VIEWER

The Diagnosis Server also works with Diagnosis Clients which addresses via IPv6 addresses. For this the format of the log file has been adapted. The Diagnosis Viewer only reads the new format of the log files. If files from older zenon versions are opened (or vice versa), the IP address of the Diagnosis Client is not displayed correctly.

## 3.5 Licensing

The licensing determines:

- ▶ The version of zenon Web Server that runs:
  - zenon Web Server
  - zenon Web Server Pro
  - zenon Web Server Pro Light
- ▶ Number of possible parallel zenon Web Client connections (Concurrent Use License)

**Note:** **zenon Web Server** runs in demo mode without a valid license. In doing so, the following restrictions apply:

- ▶ the **zenon Web Server** can only be started manually
- ▶ The duration that the program can run for is limited to 30 minutes
- ▶ The number of possible clients is limited to 2

To switch from demo mode to a valid license, stop the **zenon Web Server** and enter a valid license number in the License (on page 35) tab. Restart the **zenon Web Server** manually.



### Information

The following **dynamic text** elements can be used without a license for **zenon Web Server Pro** and **zenon Web Client**:

- ▶ **User name**
- ▶ **Password**
- ▶ **Signature**

## ZENON OPERATOR AND WINDOWS CE:

zenon Web Server Pro Light is available for zenon Operator.

For Windows CE, there is zenon Web Server Pro Light built into Runtime available - Runtime must be started in order for zenon Web Server Pro Light to run. This is limited in functionality due to the platform. Licensing is checked via Remote Transport in the Editor with remote licensing.

You can also enter the license for the zenon Web Server via the licensing:

1. Please open **Start -> All programs -> COPA-DATA -> Tools 7.11 -> Licensing.**

or:

Start the **zenon Web Server** via **Control panel -> zenon Web Server.**

2. The dialog for entering license data opens.
  - Select zenon **Web Server**.
3. enter the serial number and the activation number

You find the data for this:

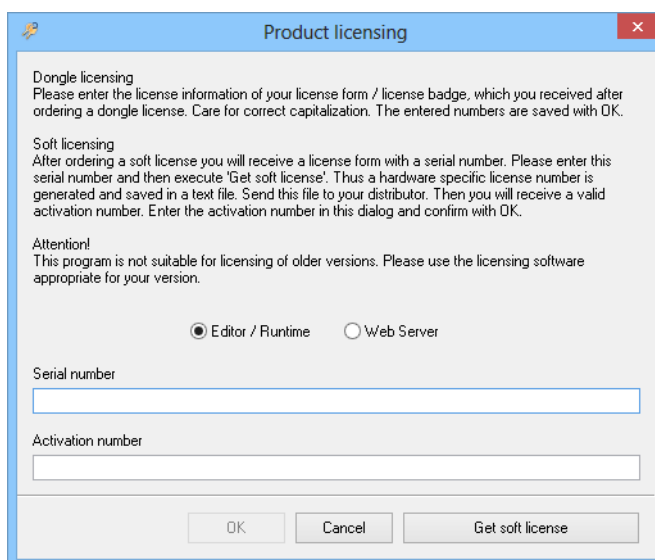
- on your license certificate
- On the license sticker

Path Windows 7/8: C:\Users\Public\Documents\zenon\_Projects\

**Note:** Pay attention to capital letters and small letters when entering the data!

4. restart the **zenon Web Server** on the **State** tab.
5. Once you have restarted the computer, you will use zenon Web Server with the license entered.

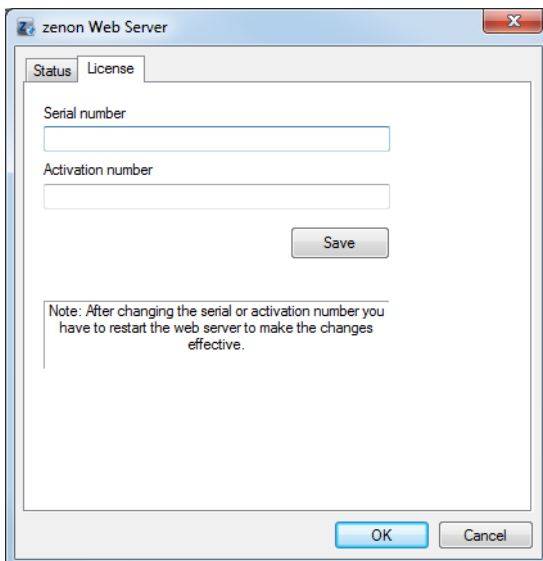
## LICENSING DIALOG



Parameters	Description
<b>Editor/Runtime</b>	Active: License is valid for the zenon Editor or the zenon Runtime.
<b>Web Server</b>	Active: License valid for zenon Web Server.
<b>Serial number</b>	License serial number.  If there is already a license available, its serial number is displayed here. Enter the current serial number here.
<b>Activation number</b>	License activation number.  If there is already a license available, its activation number is displayed here.
<b>OK</b>	Import data and start zenon with this license when it is next started.
<b>Cancel</b>	Discard entries and use zenon with the previous license or no license.
<b>Request soft license</b>	Opens the dialog to request a soft license.

Alternative:

1. Start the zenon Web Server via **Control panel -> zenon Web Server**.
2. Enter, in the **License** tab in zenon Web Server, the serial number and the activation number that is shown on the license form.



3. Click on **Save** in order to save the two numbers.
4. Restart the **zenon Web Server** on the **State** tab.



### Attention

*The zenon Web Clients that are connected lose their connection when restarted. The zenon Web Clients will do an automatic reconnect after a certain timeout.*

Note: License number and activation number are entered in the **zenWebSrv.ini**.

## 3.5.1 Dongle licensing

zenon supports the **WibuKey** and **Codemeter** systems for licensing via a dongle. For details on this, see the Dongle licensing section in the Licensing handbook.

Licensing via a dongle is implemented by means of:

- ▶ A computer-based dongle or
- ▶ Network dongle

### COMPUTER-BASED DONGLE:

Using a computer-based dongle:

1. You receive a dongle and a license certificate with a serial number and activation number.
2. Close the dongle with the same computer on which you have installed the zenon Web Server.
3. Register the license (on page 35) in the system.

### NETWORK DONGLE:

As an alternative to the dongle on the same computer, you can also use the central COPA-DATA network dongle. This can be plugged into any desired computer in the network. Licensing is carried out in the same way as the computer-based dongle.



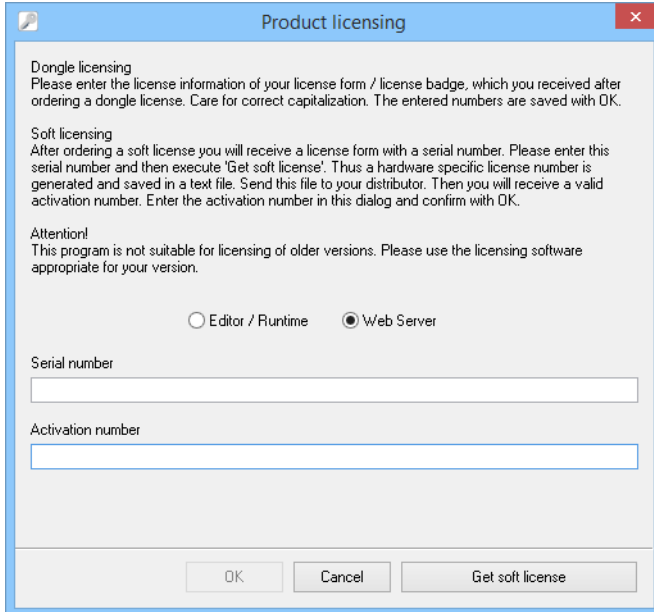
### Information

*If a copy of zenon Web Server licensed with Codemeter loses the connection to the dongle, the Web Server is ended.*

## 3.5.2 Soft licensing

For soft licensing:

1. Start the Web Server licensing program.



The 'Product licensing' dialog box contains the following text:

**Dongle licensing**  
Please enter the license information of your license form / license badge, which you received after ordering a dongle license. Care for correct capitalization. The entered numbers are saved with OK.

**Soft licensing**  
After ordering a soft license you will receive a license form with a serial number. Please enter this serial number and then execute 'Get soft license'. Thus a hardware specific license number is generated and saved in a text file. Send this file to your distributor. Then you will receive a valid activation number. Enter the activation number in this dialog and confirm with OK.

**Attention!**  
This program is not suitable for licensing of older versions. Please use the licensing software appropriate for your version.

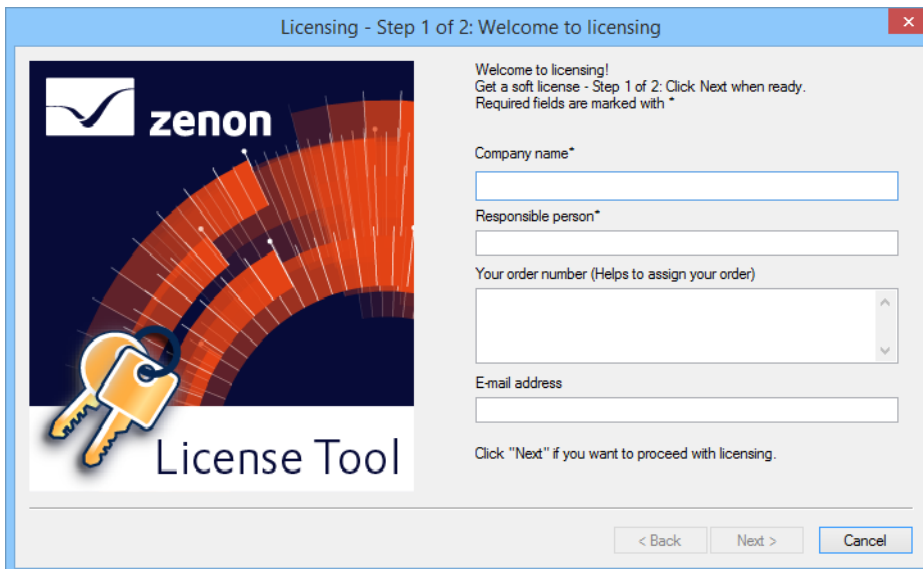
Radio buttons: ☐ Editor / Runtime, ☒ Web Server

Serial number: [text input field]

Activation number: [text input field]

Buttons: OK, Cancel, Get soft license

2. Click on the **License request** button for **soft licensing**.
3. The form for your license data is opened.



The 'Licensing - Step 1 of 2: Welcome to licensing' dialog box contains the following text:

Welcome to licensing!  
Get a soft license - Step 1 of 2: Click Next when ready.  
Required fields are marked with \*

Company name\* [text input field]

Responsible person\* [text input field]

Your order number (Helps to assign your order) [text input field]

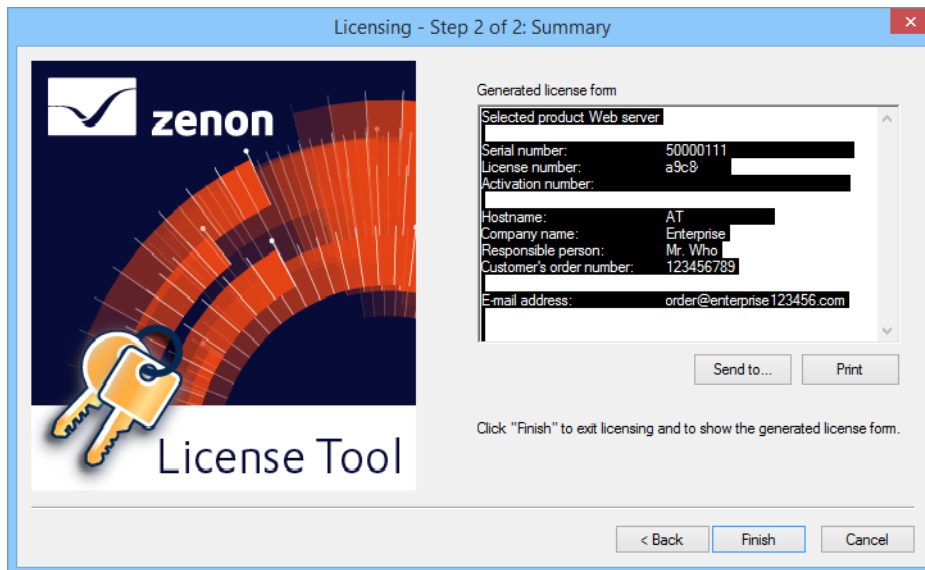
E-mail address [text input field]

Click "Next" if you want to proceed with licensing.

Buttons: < Back, Next >, Cancel

4. Fill out all fields and click on **Next**

5. The program creates a license request certificate with the license number that is valid for your computer.

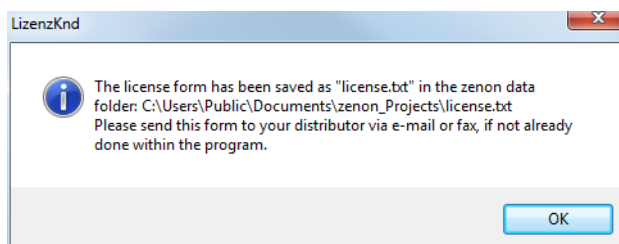


6. Send your license request to your sales partner:

- a) By clicking "Send via email"
- b) By clicking "Print as print-out or fax"

The license number is also included on the license certificate and must correspond to that of your computer.

7. An infobox summarizes the process.



8. As soon as you have received your license data, register the license (on page 35) in the system.

## 3.6 Redundancy operation

The zenon Web Server can also be operated as redundant. If a zenon Web Server fails or is stopped, the zenon Web Client automatically switches to the Standby Web Server.



### Attention

*An automatic switch back - as with the Primary Server - is not carried out. zenon Web Client remains connected to the zenon Standby Web Server until:*

- ▶ zenon Web Client is restarted or
- ▶ The zenon Standby Web Server is stopped or fails

Then the zenon Web Client tries to connect with the first zenon Web Server defined as standard.

If only one zenon web server is used, it is strongly recommended that this is not operated on the Primary Server or the standby server. If this computer fails, the zenon web server will also fail.

## 3.7 HTTP Tunneling

The zenon Web Server can also, instead of TCP connections, accept HTTP connections. HTTP connections are only accepted by zenon Web Clients. The connection from the Web Server to Primary Server is always made via TCP. A separate HTTP connection is created for each connection from the Web Client to the Web Server.

Connections are made via TCP by default.

To use HTTP tunneling, the following must be the case:

- ▶ HTTP must be activated using the configuration dialog or the entry in **zenon6.ini**
- ▶ Port 8080 or the alternative port configured in **zenon6.ini** on the PC Web Server must be reachable
- ▶ The Project entry page for Web Clients, which should connect to the Web Server with HTTP tunneling, should have the **UseHTTP** parameter with a value that is not 0 in the **<embed>** and **<object>** entry

**Note:** HTTP tunneling is not available with Windows CE.

### CONFIGURATION OF THE PORT:

On the computer with zenon Web Server:

1. Open the **zenon6.ini** file.
2. Navigate to the **NET\_PROXYPORT=** entry or create this
3. Configure the desired port  
 Default: 8080  
 The Web Server listen on the port, the Web Client connects to the port.
4. Save the **zenon6.ini** file.

On the computer with zenon Web Client:

- Configure the HTTP port in the **zenon6.ini** file on the computer with the web client by carrying out the above-mentioned steps again on this computer.

**Note:** Each change to the port number in zenon6.ini on the computer on which the web server is running must also be created accordingly on all computers configured with zenon Web Client. Furthermore, the HTTP port may need to be configured manually on the computer with the web server in the Windows Firewall, as an exceptional port for incoming connections.

#### **PROCEDURE:**

The Web Client sends its messages for the Runtime server to the Web Server via HTTP POST. This forwards it to the assigned connection to the Runtime server via TCP. The Runtime server sends its messages for the Web Client via TCP to the Web Server, which buffers them.

The buffer of a connection is emptied by the Web Client through HTTP GET requests. If no message is available for a connection, the client waits for a configurable time (**POLLING\_INTERVALL** entry in **zenon6.ini** with a standard value of 2 seconds).

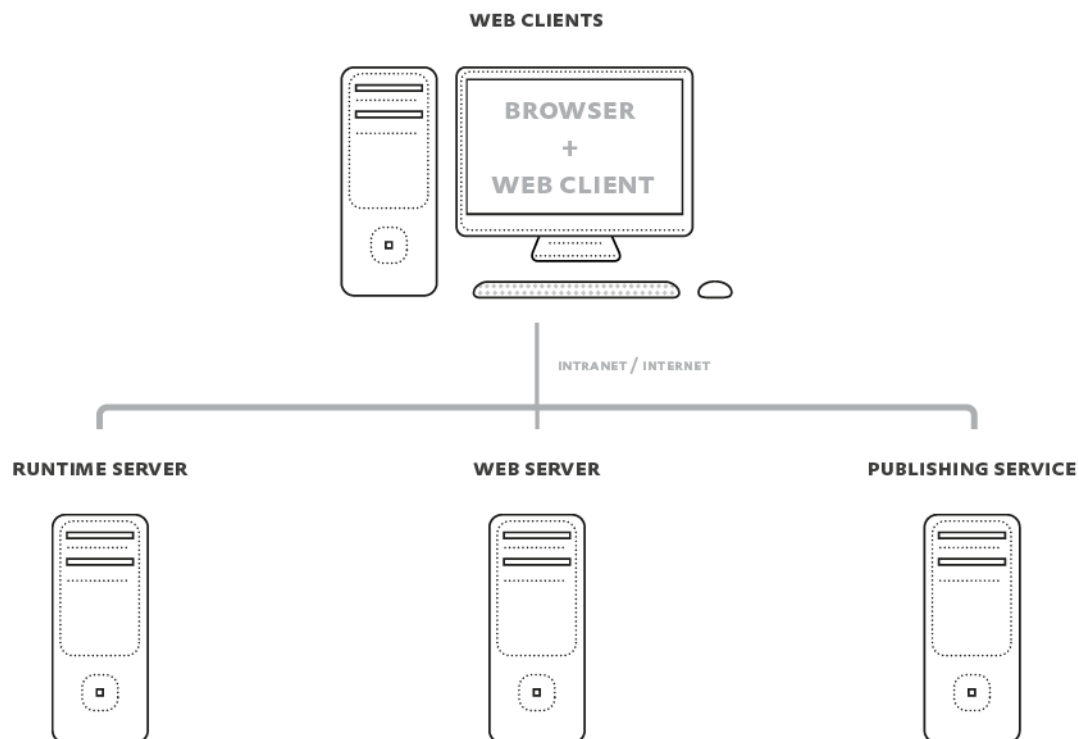
For details, see the Procedure for HTTP connection (on page 43) chapter.

#### **ERROR MESSAGES:**

If the HTTP connection is active, network-specific messages are sometimes shown in the Diagnosis Viewer instead of HTTP-specific messages. For example, if a connection is made or disconnected or in the event of an HTTP error.

### 3.7.1 Procedure with HTTP connection

If a Web Client is started, it connects to the Primary Server via the zenonWeb Server:



1. The user starts the browser and opens the project entry page (on page 26).
2. The project entry page instigates the browser to start the Web Client with the pre-defined HTTP tunneling configuration.
3. The Web Client makes 3 HTTP connections (control, data and file synchronization connection) to the Web Server:
  - a) A connection ID is requested from the Web Client.
  - b) The Web Server sends a free connection ID if one is available. The ID sent is entered into the list of connection IDs issued. This happens so that no ID can be issued twice and to transfer the HTTP connection to a TCP connection.
  - c) The network init packet is sent to the Web Server via the HTTP connection.
  - d) The Web Server checks to see if this Web Client is already in the list of active clients. If the client is new, a check is made to see if the maximum number of clients has already been reached. If the client connection can be accepted, a TCP connection is made in Runtime and the init packet is forwarded. The accepted client connection and the server connection that has been made are mapped to each other until the connection has ended: Data from the client connection is forwarded via the server connection and vice versa.

4. Data exchange:
  - a) The Web Server works as a protocol translator between TCP and HTTP and buffers the messages.
  - b) Data from Runtime for the Web Client is buffered on the server. The Web Client calls this up by means of GET requests.
  - c) Data from the Web Client for Runtime is sent by the Web Client by means of a POST request and forwarded to Runtime by the Web Server.
5. If the Web Client is ended in the browser (browser is closed or the project entry page is left), the connections to the Web Client are disconnected.
  - a) The web client sends a network-end package to Web Server. The Web Server forwards this to Runtime, ends the connection and clears the occupied resources (working memory, ports, connection ID ...).
  - b) When the client is cleared, an additional HTTP end packet is sent to the Web Server, to ensure that the connection ID was removed from the list.

## 3.8 Supported web browsers:

zenon Web Client supports the following browsers:

- Microsoft Internet Explorer

**Attention:** zenon Web Client, as a 32-bit application, must be used with the 32-bit version of Internet Explorer.

The 64-bit version cannot be used.

It is recommended that you always use the most up to date version.



### Information

*The browser for zenon Web Client must support one of the following operating systems:*

- ▶ Windows 7
- ▶ Windows 8 and 8.1
- ▶ Windows Server 2008 and 2008 R2
- ▶ Windows 10
- ▶ Windows Server 2012

*Other operating systems, such as Windows CE, Linux or others are only usable in combination with a terminal server.*

### **BROWSER START:**

The project entry page (on page 26) decides the basis of browser identification, if and how the Web Client is started:

- ▶ Internet Explorer: Start as ActiveX component
- ▶ Other browsers or non-supported versions: An error message is displayed; the zenon Web Client does not start

### **SUPPORTED VERSIONS:**

Browser	From version	Remark
Microsoft Internet Explorer	▶ 6.0	<ul style="list-style-type: none"> <li>▶ Recommended from: 8.0</li> <li>▶ 32-bit version only</li> <li>▶ Note the information on memory protection for IE 8/9</li> </ul> <p><b>Attention:</b> Internet Explorer 11 does not support ActiveX and thus cannot be used as a zenon <b>Web Client</b>. This also applies for IE as a mobile app, Metro Style and under RT.</p>

## 3.9 Folder for Runtime files

zenon Web Server saves the Runtime files in the %Temp%\zenWebCli folder as standard.

%Temp% signifies the temporary file folder under Windows. This is saved individually for each user and can be changed under **System control-> System -> Advanced system settings-> Environment variables**.

**Note:** The %Temp% folder is user-dependent. Each Windows user thus loads the Runtime files from the Primary computer.



#### Attention

*When using Microsoft Internet Explorer in **secure mode** the Runtime files are saved in the %Temp%\Low folder.*

You can define any desired folder as the storage location for the Runtime files with the **zenon6.ini** entry:

1. Open the **zenon6.ini** file.
2. Navigate to the section  
**[PATH]**
3. Create or modify the entry

**WEB\_PROJECT\_PATH=**

## 3.10 VSTA and VBA with zenon Web Client, zenon Web Server and zenon Web Server Pro

**Note:** VBA is supported by zenon in zenon Web Server and zenon Web Server Pro. However for security reasons, we recommend that you switch to VSTA. You can find out further information on VBA in the macro list.

VSTA is supported by zenon with different versions of zenon Web Server und zenon Web Server Pro (on page 6).

Function	zenon Web Client with zenon Web Server Standard	zenon Web Client with zenon Web Server Pro
<b>Show VSTA macro dialog</b>	+	+
<b>Execute VSTA macro</b>	+	+
<b>Open VSTA editor</b>	-	-
VSTA events	+	+
Remark	<ul style="list-style-type: none"> <li>▶ No values are written to zenon variables.</li> <li>▶ Windows messages boxes can be opened.</li> <li>▶ Compiling and debugging is not possible. To do this, a standard zenon Runtime must be used.</li> </ul>	<ul style="list-style-type: none"> <li>▶ All zenon VSTA functionalities are available in full.</li> <li>▶ Compiling and debugging is not possible. To do this, a standard zenon Runtime must be used.</li> </ul>

### **INSTALLATION:**

For the use of VSTA

- ▶ The following applications must be present on the system or installed manually:
  - Microsoft Visual Studio Tools for Applications 2.0 (VSTA 2.0)
  - Microsoft .NET Framework 3.5

Both programs are on the installation medium for zenon Web Server or zenon 7.50.

- ▶ **VSTAIntegration.dll** must be in the zenon program directory.  
This is installed automatically when zenon is installed.

### **INI ENTRIES:**

The following entries must be set in **zenon6.ini**:

[VSTA]

ON=1

CSHARP=1

[VBA]

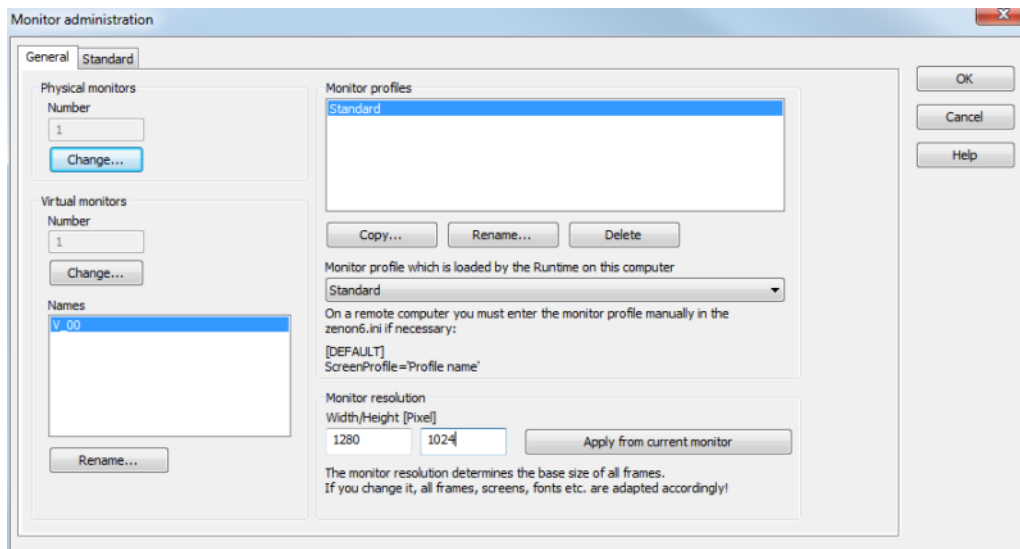
EIN=1

EVENT=1

### 3.11 Screen resolution and monitor administration

zenon monitor administration is available in zenon Web Client with limitations.

**Important for configuration:** The automatic adaptation of the resolution to the client cannot be used for web use. For this reason, the screen size must be set accordingly during configuration. zenon Web Client uses the screen size set for the project as standard: **Project properties** -> **Graphical design** -> **Monitor administration** -> Click on the ... button -> Tab **General** - **Screen resolution**.



The resolution can be scaled using the zenon Web Client setting. For details, see Configuration of the example page chapter.

With the help of the zoom property, zenon Web Client can be zoomed to the size of an ActiveX element.

#### SIZE IN THE BROWSER:

The browser always needs some screen area for menus and scroll bars. So the area, which is available for the zenon Web Client, is always smaller than the defined monitor resolution. If you would like to have a full screen of the project in the browser, you must set the screen size as smaller than the screen size on the zenon Web Client.

For example:

Monitor resolution on zenon Web Client PC: 1024x768 pixel

Screen size in monitor administration: 800 x 600.



### Information

*If you want to use the multi-project administration on the zenon Web Client, the screen size has to be the same for all projects!*

## **MULTI-MONITOR SYSTEM:**

On a multi-monitor system, the process screens are opened as defined in the profile, on different real monitors. When using a Web Client, these are then outside of the visible area, but can be reached by scrolling.

**Recommendation:** Configure the monitor profile in such a way that all monitors are on Main monitor mapped; you then have access to all monitors.



### Information

*The standard profile is always loaded by default on the zenon Web Client. However, you can stipulate a different monitor profile using the **SCREENPROFILE=** entry in `zenon6.ini`.*

## **3.12 Implementing the zenon Web Server in the internet environment**

**Note:** If a web client is to contact a web server via the Internet, it is strongly recommended that a VPN connection is set up between the network with the Web Client computer, the network with the Web Server computer, and the Primary Server.

To integrate zenon Web Server into an internet environment:

- ▶ Any firewall that may be present must be configured accordingly:
  - **Port 1102** on the firewall must be open for incoming packages, so that a zenon Web Client can access a zenon Web Server and therefore access a Primary Server.
  - NAT (Network Address Transformation) must run on the gateway station. NAT transforms the internal LAN address to the address of the gateway station. If, for example, somebody surfs inside the LAN, it always looks as if the gateway station were sending the requests from outside.
  - Static IP address for zenon Web Server:  
The firewall on the gateway station has to be configured in such a way that all incoming packages for port 1102 are **automatically** sent to the station with the zenon Web Server. That means: This station must have a static IP address.

- ▶ The project entry page has to be adapted so that zenon Web Client knows which station to access in the internet: The amendment is made in **global\_vars.js** or, for older versions, in **project\_A\_X.html** (X stands for the language version, such as G for German) :
  - Under Webserver **VALUE= WEB-SERVERNAME**, the `computer` name of the gateway station (the station visible from the internet and not the computer name of the real zenon Web Server) has to be entered. The real zenon Web Server is not visible from the internet. The gateway station then automatically forwards the requests from the zenon Web Client to port 1102, then automatically to the real zenon Web Server.

### 3.13 Error Handling

Known error messages or execution errors:

- ▶ Crash after browser refresh (on page 50)
- ▶ ActiveX control failed to load (on page 51)
- ▶ ActiveX control not installed correctly (on page 52)
- ▶ Exceptional Web Client error in Internet Explorer 8 (on page 52)
- ▶ HTTP error messages (on page 53)
- ▶ Init Runtime Error (on page 57)
- ▶ Keyboards in Firefox (on page 57)
- ▶ Max. clients (on page 58)

#### 3.13.1 Crash after browser refresh

Using Internet Explorer 6 with the zenon Web Client can lead to Internet Explorer crashing if the browser **refresh** button is clicked. We therefore recommend that you do not use the **refresh** button.

This button causes a complete closure and restart of the zenon Web Client. This means, that the connection to the Runtime server is closed and has to be re-established by the Web Client.

#### ERROR 101

If zenon Web Client was already installed on the client computer, the following error message can be displayed when zenon Web Client connects to zenon Web Server or Runtime:

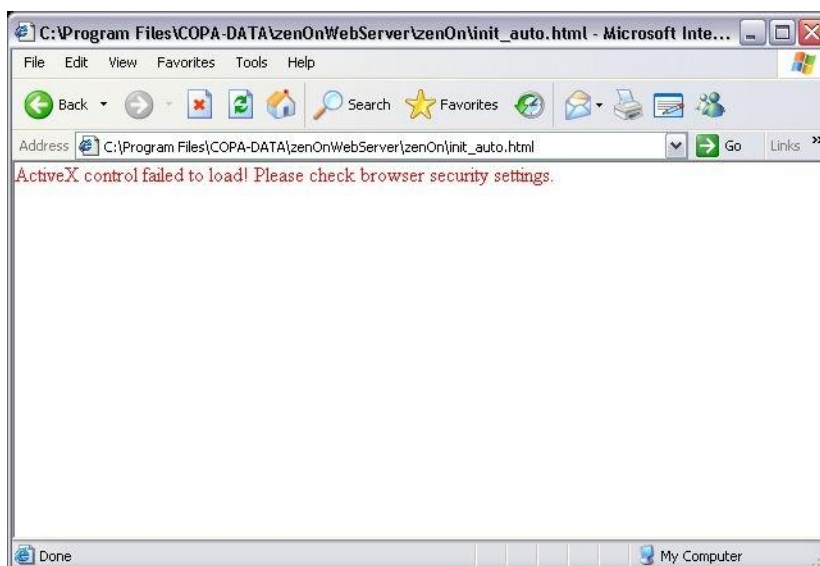
#### Error 101

**Project XXX was edited with version XXX and cannot be opened here**

In this case:

1. Uninstalling Web Client
2. Restart the computer
3. New installation of zenon Web Client

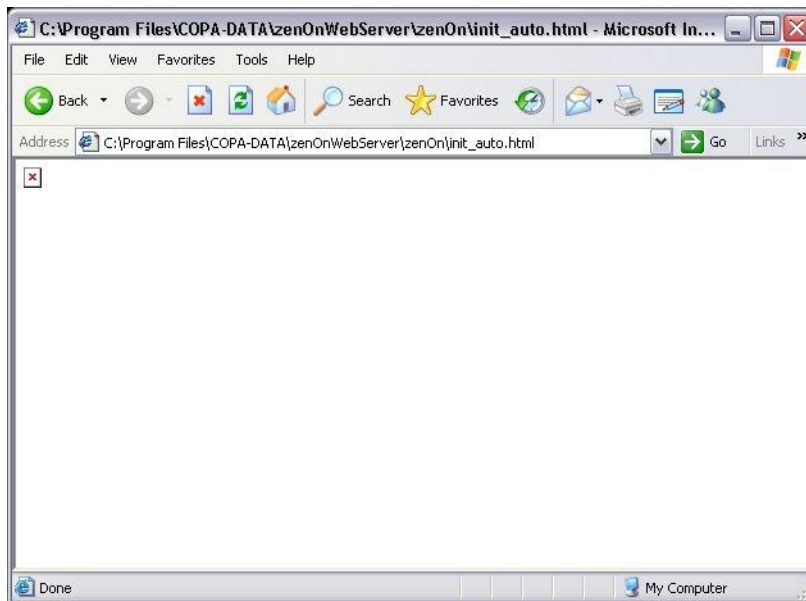
### 3.13.2 ActiveX control failed to load



If the browser displays an Init Runtime Error, there are several possible reasons for that: The most probable thing:

- The browser's security settings prevent the correct execution of the ActiveX control.

### 3.13.3 ActiveX control not installed correctly



If the browser only displays an X, instead of Runtime, after the project start page has been called up:

- ▶ The ActiveX control for zenon Web Client was not installed correctly
- ▶ The wrong version (on page 23) of zenon Web Client is installed

### 3.13.4 Exceptional Web Client error in Internet Explorer 8

#### ERROR

The Web Client is ended with an exceptional error if VSTA or VBA is executed in the project in the project.

#### REASON

Microsoft Internet Explorer has a setting for memory protection from version 8. If this is active, executing VBA leads to an exceptional error and Internet Explorer ends. VSTA always activates VBA too.

#### SOLUTION

Deactivate the memory protection in Internet Explorer under:

Extras->Internet options->Advanced->Enable memory protection to help mitigate online attacks

### 3.13.5 HTTP error messages

Error messages and what they mean:

Entry	Level	Description
<b>NetSrv Error Do Send HTTP failed! HTTP-Status: [HTTP-Status]</b>	ERRORS	The HTTP Web Server has responded to an HTTP POST request with an error.
<b>NetSrv Error Do Send HTTP failed!</b>	ERRORS	The HTTP POST request failed (e.g. timeout).
<b>NetSrv Error Do Send HTTP Server failed! Data Management Class Error!</b>	ERRORS	An error occurred when saving a message in the buffer to the HTTP Web Server. The error occurred in the data management class.
<b>NetSrv Error Do Send HTTP Server failed!</b>	ERRORS	An error occurred when saving a message in the buffer to the HTTP Web Server. The error occurred in the buffer list.
<b>NetSrv Error Do Recv HTTP failed! HTTP status: [HTTP-Status]</b>	ERRORS	The HTTP Web Server has responded to an HTTP GET request with an error.
<b>NetSrv Error Do Recv HTTP failed!</b>	ERRORS	The HTTP Get request failed (e.g. timeout).
<b>NetSrv Error Do Recv HTTP Server failed! Data Management Class Error!</b>	ERRORS	An error occurred when reading a message in the buffer to the HTTP Web Server. The error occurred in the data management class.
<b>NetSrv Error Do Recv HTTP Server failed! Buffer Too Small!</b>	ERRORS	The packet read from the buffer list is too large for the data buffer.  Note: Due to the uniform maximum packet size, which also serves as a buffer length definition, this should never occur.
<b>NetSrv Error Do Recv HTTP Server failed! Error While Copying Data Into Buffer!</b>	ERRORS	An error occurred when copying data from the buffer list.
<b>Error Out Of Memory While Adding Data to HTTP GET Response</b>	ERRORS	Creation of a memory area was not possible when compiling an HTTP response at the HTTP Web Server.
<b>Error On Adding Data to HTTP GET Response</b>	ERRORS	An error occurred when copying data from the buffer list in the HTTP response.
<b>HTTP Send Get Response Failed: [Status]</b>	ERRORS	Sending of a response to an HTTP GET request has failed. The status code is a system error code (can be looked up in the MSDN library).
<b>Error Out Of Memory While Receiving Data from HTTP POST</b>	ERRORS	Creation of a memory area was not possible when reading off an HTTP POST response at the HTTP Web Server.
<b>Error on Receiving Data from HTTP POST [Status]</b>	ERRORS	Reading off data from the HTTP-POST request has failed. The status code is a system error code (can be looked up in the MSDN library).
<b>Error Data Block Of HTTP Post Request Too Large</b>	ERRORS	The data from the request received exceeds the defined maximum packet size.
<b>HTTP Send Post Response Failed: [Status]</b>	ERRORS	Sending of a response to an HTTP POST request has failed. The status code is a system error code (can be looked up in the MSDN library).

<b>Error Out Of Memory While Parsing HTTP Request</b>	ERRORS	Creation of a memory area was not possible when forwarding an HTTP response to the relevant thread.
<b>Memory Error on Creating Receive Buffer</b>	ERRORS	Creation of a memory area when creating the HTTP receipt buffer was not possible.
<b>Error on Creating HTTP Request Event</b>	ERRORS	Creation of events for the receipt of HTTP requests has failed.
<b>Error While Waiting For HTTP Request: [Status] --&gt; Exiting Listening Thread</b>	ERRORS	An error occurred when waiting for an HTTP request. The status code is a system error code (can be looked up in the MSDN library).
<b>Unexpected Result While Waiting For HTTP Request: [Status] --&gt; Exiting Listening Thread</b>	ERRORS	Waiting for an HTTP request provides an unexpected result. The status code is a system error code (can be looked up in the MSDN library).
<b>HTTP Request Without ID Received</b>	ERRORS	The connection ID was not present in the HTTP request.
<b>Error on Extracting HTTP-Request-ID From URL</b>	ERRORS	The connection ID of the HTTP request cannot be read off.
<b>Error: Closing HTTP Connection ID [ID] Could Not Be Resolved</b>	ERRORS	An attempt was made to close a connection that does not exist or was already closed. This error is less critical because the request to delete the connection ID when clearing connection resources can be made more than once after it has ended.
<b>HTTP Request With Incompatible ID Format Received</b>	ERRORS	The connection ID in the HTTP request does not have the expected format.
<b>Could Not Assign New HTTP ID Because The Map Is Full</b>	ERRORS	A new connection could not be accepted because there is no more space in the connection list. The list contains space for over 4.2 billion connections, so this message should therefore never appear.
<b>Error During HTTP Accept</b>	ERRORS	An error occurred when accepting the HTTP connection.
<b>Error On Sending HTTP ID: [Status]</b>	ERRORS	The sending of an HTTP response with the connection ID for the new client connection has failed. The status code is a system error code (can be looked up in the MSDN library).
<b>Error: HTTP Connection ID [ID] Could Not Be Resolved</b>	ERRORS	The connection ID of the HTTP request cannot be resolved.
<b>Error: HTTP Request Could Not Be Assigned To The Socket</b>	ERRORS	The HTTP request could not be forwarded to the relevant thread.
<b>Unsupported HTTP-Request Received</b>	ERRORS	An unsupported HTTP request was received. GET and POST requests are supported.
<b>Error While Receiving HTTP Request: [Status] --&gt; Exiting Listening Thread</b>	ERRORS	An error occurred when receiving an HTTP request.
<b>Error on Removing HTTP</b>	ERRORS	An error occurred when removing a connection ID from the list.

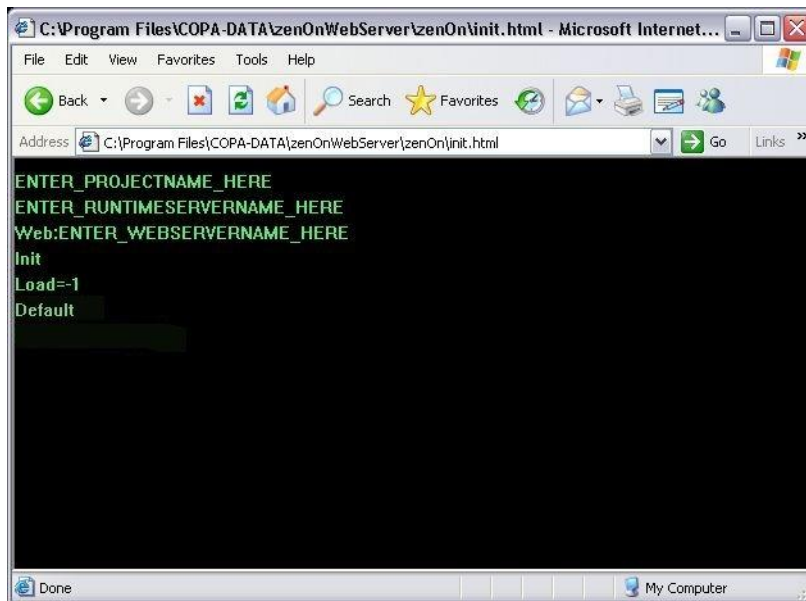
<b>Connection ID From The Map!</b>		Connection IDs are removed if a connection is closed.
<b>Removing HTTP Connection ID [ID] From The Map!</b>	DEBUG	The connection was closed and the ID was removed from the list.
<b>Error on Removing Non-Active HTTP Connection ID From The Map!</b>	ERRORS	An error occurred when removing an inactive connection ID. A connection is then active if no HTTP requests have been received for 5 minutes. Such a connection should really already be removed due to the lack of a watchdog.
<b>Removing Non-Active HTTP Connection ID [ID] From The Map!</b>	DEBUG	The connection ID was removed from the list because the connection is inactive. A connection is then active if no HTTP requests have been received for 5 minutes. Such a connection should really already be removed due to the lack of a watchdog.
<b>Error While Waiting for HTTP Connection Map Check [Status]!</b>	ERRORS	The thread to check the connection ID established an error when waiting for the next cycle and is ended. The status code is a system error code (can be looked up in the MSDN library).
<b>NetSrv Accept HTTP Client Socket Error On Starting HTTP Reply Thread</b>	ERRORS	The thread to respond to HTTP requests could not be started.
<b>NetSrv Info Accept HTTP Client IP:[IP-Adressr]:[Port] Ok</b>	DEBUG	The HTTP connection has been accepted successfully.
<b>NetSrv Memory Error Do Recv HTTP failed!</b>	ERRORS	An error occurred due to too little memory being available when receiving data via HTTP tunneling.

## LOG ENTRIES FROM CNSBLOCKINGSOCKETEXCEPTIONS

Level: Always ERRORS

Entry: Exception text	Description
<b>Connect: HTTP error</b>	The HTTP Web Server has responded to a connection ID request with an error.
<b>Connect: ID-Data did not have the expected Format</b>	The connection ID provided by the HTTP Web Server does not have the expected format.
<b>Connect: Server denied HTTP ID</b>	The HTTP Web Server has rejected the granting of a connection ID.
<b>Connect: Error during ID-Acquisition</b>	An error occurred when requesting a connection ID (e.g. timeout).
<b>HttpInitialize Failed</b>	HTTP server API could not be initialized
<b>HttpCreateHttpHandle Failed</b>	The HTTP request list could not be created
<b>HttpAddUrl Failed</b>	The server could not enter list mode

### 3.13.6 Init Runtime Error



If the browser displays an Init Runtime Error, there are several possible reasons for that:

- ▶ Runtime is not active on Runtime Server
- ▶ SERVER NAME in `Globalvars.js` (on page 15) is spelled or defined incorrectly (always use capital letters).
- ▶ PROJECT NAME in `Globalvars.js` (on page 15) is spelled or defined incorrectly (always use capital letters).
- ▶ The naming resolution between the Web Server and the Primary Server is not present in the network.
- ▶ The zenon Web Server is not started.

You may find notes on the causes of errors in the `zenNetErr.txt` file. This logs network information.

### 3.13.7 Keyboards in Firefox

If individual keyboards do not work correctly in Firefox, consider the following note:



### Attention

*Individually adapted screens of type **Keyboard** may under certain circumstances not work properly with the Mozilla Firefox browser.*

*Reason: Mozilla Firefox loads new windows in the background without putting the focus on them. Depending on the project configuration, individually-adapted keyboard screens are closed as soon as they are no longer in focus.*

*Solution: Use a different browser such as Microsoft Internet Explorer or Google Chrome, or use the "Close on loss of focus" frame option".*

*Automatic keyboards are not affected!*

## 3.13.8 Max. clients



Message to the zenon Web Client.

More clients than are licensed (on page 35) are attempting to connect to the zenon Web Server.

## 3.13.9 Behavior of Web Client in the event of a loss in connection

In the event of a loss of the connection to the Primary Server, the zenon Web Client uses the next connection configuration.

Possible reasons for a loss of connection:

- ▶ The Primary Server fails and the Primary Standby Server takes on its role.
- ▶ The Primary Server comes back and resumes its role again (= the Primary Standby Server end the connection).
- ▶ The Web Server that is currently being used fails.

The connection configurations are gone through in this sequence (from the start again once the end has been reached):

1. Web Server and Primary Server
2. Web Server and Primary Standby Server

3. Web Standby Server and Primary Server
4. Web Standby Server and Primary Standby Server

If a Web Standby Server has been configured but cannot be contacted, the following happens if the Primary Server comes back:

1. The Web Client is currently in connection configuration 2 and loses the connection because the Primary Server takes over the process management again.
2. The Web Client attempts to connect with connection configuration 3 again, but times out because the Web Standby Server cannot be reached.
3. The Web Client attempts to connect with connection configuration 4 again, but times out because the Web Standby Server cannot be reached.
4. The Web Client attempts to connect again with connection configuration 1, which also works. The web client is online again.

In the event of a failed connection, the Web Client cannot establish whether it is the Web Server (or the Web Standby Server) or the Primary Server (or Primary Standby Server) that cannot be contacted, which is why these four connection possibilities must be gone through.

## 4. HTML Web Engine

The HTML Web Engine is for the provision of zenon screens as a HTML5 web page. The user interface is called up and displayed on the visualization end device using a web browser. No special software installation or software plug-in on the end device is required for this. Process data for the visualization is taken from zenon Runtime.

Possible data:

- ▶ Variable values,
- ▶ Data of the Chronological Event List (CEL),
- ▶ Messages of the Alarm Message List (AML).

An overview of the functions of the HTML web engine:

- ▶ Session-based supply of HTML5 visualization content on HTML web clients.
- ▶ Display of basic visualization content that was created in the zenon Editor.
- ▶ Forwarding of process information, such as variable values, alarm messages or event messages from a zenon Runtime to one or more HTML web clients.
- ▶ Support of active operations, such as write set value.
- ▶ Mobile, location-independent operation and observation.

- ▶ No installation and/or configuration on the end device i.e. the client is necessary. Platform-independent display in HTML5 standard.
- ▶ Operation of the HTML web server on a different computer, such as is possible in a DMZ for example.
- ▶ Secure network communication via HTTPS, based on SSL certificates.
- ▶ Protection of sensitive visualization areas or processes by means of user authentication and support of user levels.

The HTML web engine supports authentication of a web engine client with increased security against the zenon user authentication and against Active Directory. Login is via entry of the user name and password.

## 4.1 Required components and their definitions

Components	Description
zenon Runtime	The process data for the HTML5 visualization is provided by a zenon Runtime (server or client).
<b>HTML Web Engine</b> (on page 59)	<p>The HTML Web Engine is for the provision of process screens as a HTML5 web page. The user interface is called up and displayed on the visualization end device using a web browser. No special software installation or software plug-in on the end device is required for this. Process data for the visualization is taken from zenon Runtime.</p> <p>Note: The HTML web engine processes process data for the purpose of visualization and operation by the HTML web client. The process data is only administered by zenon Runtime.</p>
<b>IIS publishing service</b> (on page 10)	Services platform of Microsoft for PCs and servers. It can be used to make documents and files accessible in the network. The HTML web engine uses IIS as a runtime environment and for the publishing of zenon process screens. HTTPS is used as a communication protocol. The HTML web engine is instanced on the IIS by means of a deployment.
<b>Web browser</b> (on page 44)	<p>Web browsers are special computer programs for the display of web sites in the World Wide Web or the general display of documents and data.</p> <p>Source:  <a href="http://de.wikipedia.org/wiki/Webbrowser">http://de.wikipedia.org/wiki/Webbrowser</a> </p>
<b>Deployment Tool</b> (on page 75)	Provides the HTML web engine as a web application in IIS and allows the configuration thereof. An existing HTML web engine instance can also be deleted.
<b>Web engine compiler</b>	Generates, from a zenon project, the data that the HTML web engine needs to provide HTML content for the web client. When translating this project data, the HTML web engine compiler checks the project contents and provides information on non-supported functions or properties. As a result of the translation process, a file is created that is provided to the web engine.

<b>SCADA Runtime Connector</b> (on page 74)	Serves as a communication interface to zenon Runtime.
---	---

## 4.2 Basic system construction of the HTML Web Engine

The HTML Web Engine is a web application that provides an HTML5 web page. In the course of a session, it is possible to make a distinction between two different connection levels:

### 1. DISPLAY OF VISUALIZATION PAGES WITHOUT PROCESS DATA:

The web client connects to the HTML Web Engine by calling up the URL (Uniform Resource Locator) for the HTML5 web page. Once the session has been set up successfully, the project can be visualized without access to process data of zenon Runtime.

### 2. DISPLAY OF THE VISUALIZATION PAGES AND DISPLAY OF PROCESS DATA:

The HTML Web Engine connects to zenon Runtime using the Runtime connector. This connection is only approved if user authentication on the basis of a user name and password has been carried out successfully. Authentication is carried out by means of external authentication to the user administration of zenon Runtime. The transfer of user information can be either manual by the web client operator or automatic by the web engine.

No special tools are required to configure the HTML5 visualization. The screens and functions are created in the zenon Editor by default.

You can find a list of the supported elements, properties and functions in the Supported functionalities for HTML visualization (on page 84) chapter.

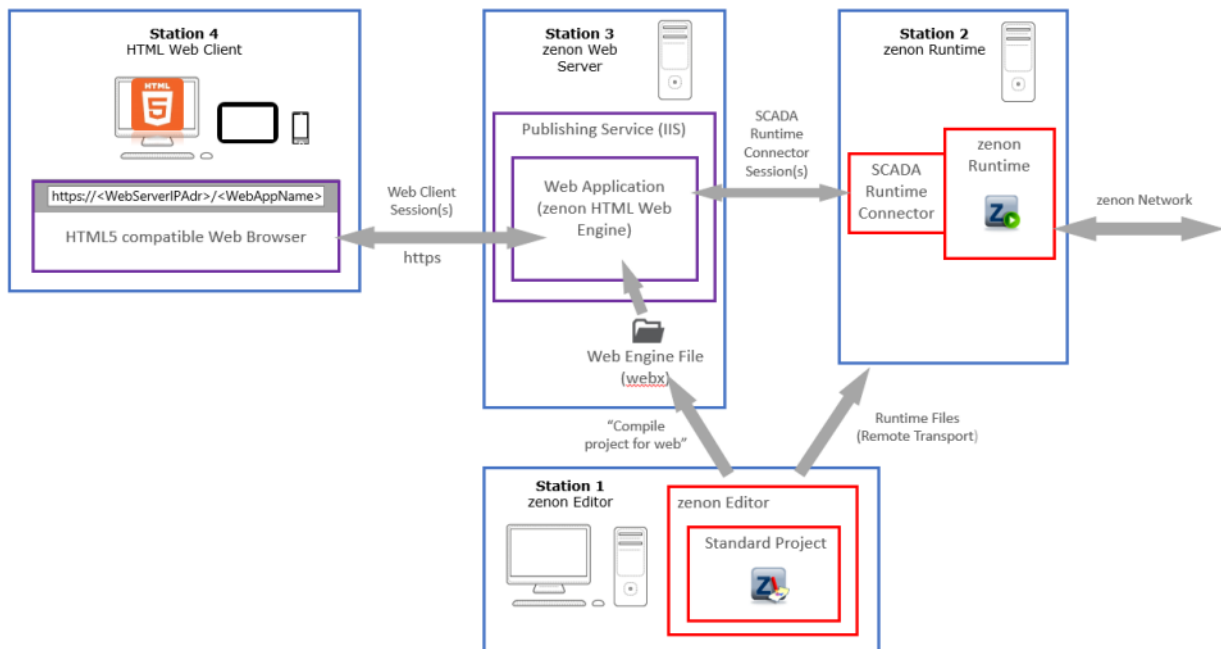
The following is a description of how an HTML5-compatible web browser can be used to access the HTML5 visualization from a visualization end device.

The operator on Station 4 connects with a standard web browser by entering the web page URL to the web server on Station 3. As a result of this, it gets the visualization pages that are there from the web engine. Only after successful user authentication is process data displayed in the HTML5 visualization. After a successful check of the user name and password, a connection to zenon Runtime is established, on Station 2 here. The interface between zenon Runtime and the web engine forms the SCADA Runtime Connector. This is integrated into the Web Engine directly. The Runtime Connector must be started from zenon Runtime.

The configuration of the HTML5 visualization is derived from a zenon Editor project – Station 1 in this case. The project states on Station 2 (zenon Runtime) and Station 3 (Web Engine) should be identical for this. The project data for use by the HTML Web Engine is translated by the web engine compiler.

The necessary steps for the installation of the HTML Web Engine on Station 3 and the deployment on the Internet Information Server are described in the Deploy: providing the HTML web engine on the IIS (on page 76) chapter.

**Note:** The breakdown of the components listed below is only for simple display. The complete configuration shown here can be operated in a network or also on any one of the individual computers in any desired distribution of the components.



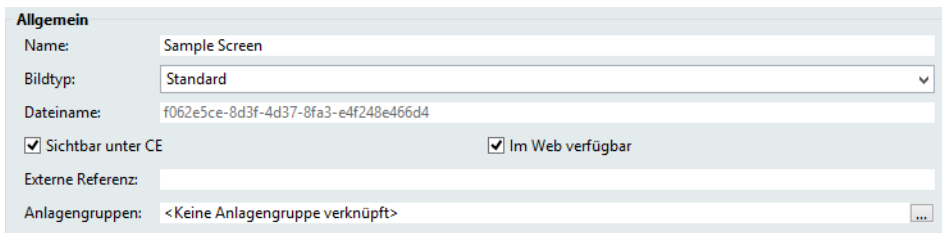
The resultant file from the web engine computer export is stored in a freely-definable directory. They are read from the HTML Web Engine here.

**Note:** It is recommended, after changes are made in the zenon project, that the compiling process is carried out again. It is recommended that, for the connection of an HTML5 visualization, a dedicated zenon Runtime is provided, in order to guarantee transparency for process-related procedures.

### Attention

It is absolutely recommended that the complete system configuration is operated in a trustworthy network area. Direct publication of the HTML5 website on the Internet is not recommended in any case.

Certain project data from the project can be called up in a web browser using the HTML web engine. The project data that is activated for display in the web browser is determined by the person configuring the project in that they activate the **Available in web** property in the properties window of the Editor for the desired screen. All screens that have been activated for this property are exported with the web engine compiler for the web engine and are primarily available for supply in the web browser on the client, station 4 (see illustration above). All screens that have not been activated for this property can be used for the zenon Runtime visualization, but are not available in the web browser.



The following screen types can be used for visualization in the web:

- ▶ Standard
- ▶ Login
- ▶ HTML
- ▶ CEL
- ▶ AML

## 4.3 System requirements

### WEB SERVER

The HTML Web Engine supports the following operating systems:

Operating system	Description
<b>Windows 7 (SP1)</b>	Professional, Enterprise and Ultimate Edition, both x86 and x64 versions.
<b>Windows 8 and 8.1</b>	Standard, Professional, Enterprise, x86 and x64 versions.
<b>Windows 10</b>	Pro, Enterprise, Education, x86 and x64 versions.
<b>Windows Server 2008 R2 (SP1)</b>	All editions with the exception of Core Edition.
<b>Windows Server 2012 and 2012 R2</b>	All editions with the exception of Core Edition.

**Note:** The .NET Framework 4.5 or higher is required for the operation of the HTML Web Engine.

## WEB CLIENT

The HTML Web Engine generally works with any modern web browser that supports the following technologies:

- ▶ HTML5,
- ▶ SVG and
- ▶ Javascript (ECMAScript 5.1)

The HTML5 content is processed in the web browser regardless of the operating system. Use of a current version of one of the following web browsers is recommended:

- ▶ Windows Internet Explorer 11
- ▶ Microsoft Edge
- ▶ Mozilla Firefox
- ▶ Apple Safari
- ▶ Google Chrome

**Note:** Javascript must be activated in the browser in order for it to be executed.

No special installation is required for the HTML Web Client.

## CLIENT-SERVER CONNECTIONS

There must be a sufficient data rate available for the connection between web server and HTML client. With a data rate that is too low, messages are primarily displayed on the HTML web client. A data rate that is too low can lead to a session not taking place or having to be canceled. The session is ended by both the client and the server.

## 4.4 Licensing

The HTML Web Engine checks the licensing of the zenon Web Server. You can find information about the procedure for licensing zenon Web Server in the [Licensing](#) (on page 35) chapter of the general zenon user documentation for zenon Web Server.

The functionality of the HTML Web Engine is adapted on the basis of the licensed Web Server versions as follows:

### WEB SERVER VERSION

- ▶ Only read access to the visualization. The HTML Web Client can be used as a viewer.

### WEB SERVER PRO VERSION

- ▶ Full access to the visualization, read and write.



#### Information

Note the limitation of the number of simultaneous client connections by the Microsoft IIS. If there is no license, the HTML Web Engine is started in a time-limited demo mode. Once the demo period and the demo extension has expired, the HTML web engine can be started in demo mode again.

## 4.5 Installation

You need the following installations to operate the HTML web engine:

### Web Server:

1. IIS publishing service:  
Set up the publishing service in accordance with the instructions in the [Install IIS publishing service](#) (on page 67) chapter.
2. zenon Web Server.  
Install zenon Web Server from the installation medium.  
Microsoft Web Deploy is also installed automatically during setup.

### Project configuration and runtime application:

1. zenon (Editor and Runtime).

Note: No special installation is required for the HTML Web Client.

### 4.5.1 IIS Publishing service installation

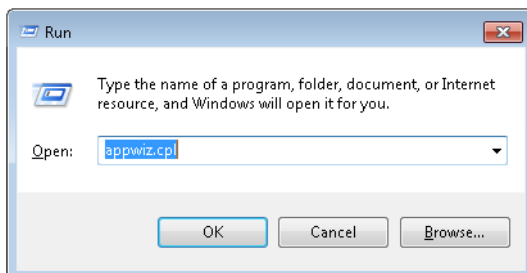
Internet information Services, abbreviated to IIS, are for the publication of documents, such as HTML pages, using the HTTP protocol. In the operating systems listed in the System requirements (on page 64) chapter, the IIS publishing service is already included in the standard installation. This need only be activated by means of the Windows features.

To activate the IIS Publishing Service, proceed as follows:

#### IIS 7, WINDOWS 7

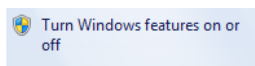
1. Press and hold the **Windows** key on your keyboard and press the **R** key at the same time.
2. Enter `appwiz.cpl` into the empty field.

Click on **OK**.

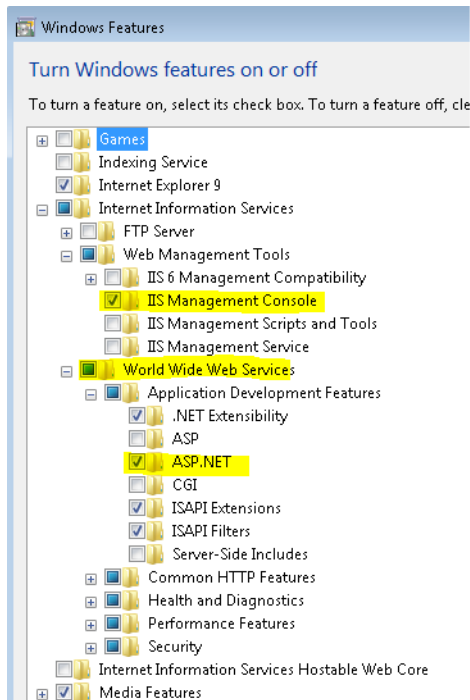


The window with the programs and features from the Control Panel opens.

3. In this window on the left, click on Turn Windows features on or off.



A new window with Windows features opens.



1. Expand the **Internet information services** in this node.
2. Activate all `World Wide Web Services` there.
3. Expand the **Application development features** node.
4. Activate `ASP.NET`.

**Note:** Under Windows 8, IIS 8, you must activate `ASP.NET 4.5` and the `WebSocket` protocol at this stage.

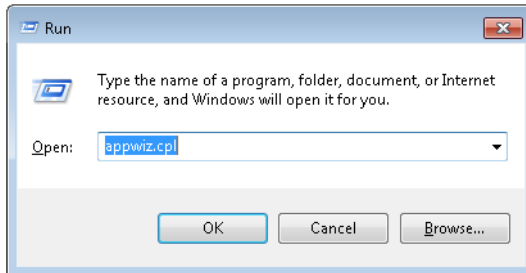
5. Expand the **Web administration tools** node.
6. There, activate the `IIS administration console`.
7. Click on **OK**.

**Note:** With subsequent installation or upgrading of the .NET frameworks under Windows 7, this software must be registered manually in the IIS publishing service in order to be able to be used. For more details, see the .NET registration on IIS under Windows 7 (on page 73).

## IIS 8, WINDOWS 8/8.1

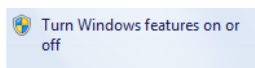
1. Press and hold the `Windows` key on your keyboard and press the `R` key at the same time.
2. Enter `appwiz.cpl` into the empty field.

Click on **OK**.

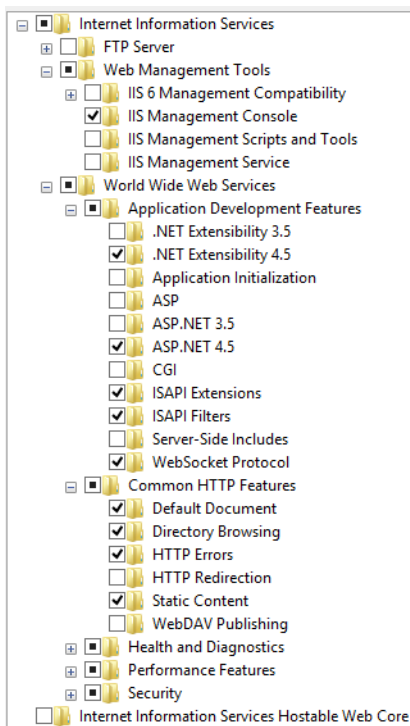


The window with the programs and features from the Control Panel opens.

3. In this window on the left, click on Turn Windows features on or off.



A new window with Windows features opens.



1. Expand the **Internet information services** in this node.
2. Activate all **World Wide Web Services** there.
3. Expand the **Application development features** node.
4. Activate **ASP.NET 4.5**

**Note:** Under Windows 8, IIS 8, you must activate **ASP.NET 4.5** and the **WebSocket** protocol at this stage.

5. Expand the **Web administration tools** node.

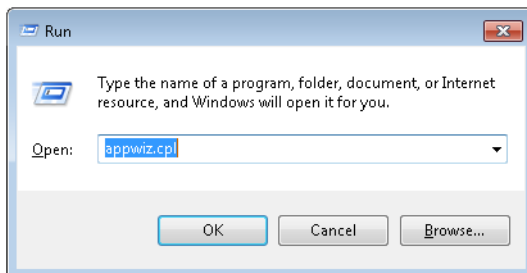
6. There, activate the IIS administration console.
7. Click on **OK**.

**Note:** The WebSocket protocol must be activated.

## WINDOWS 10

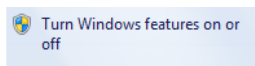
1. Press and hold the Windows key on your keyboard and press the R key at the same time.
2. Enter `appwiz.cpl` into the empty field.

Click on **OK**.

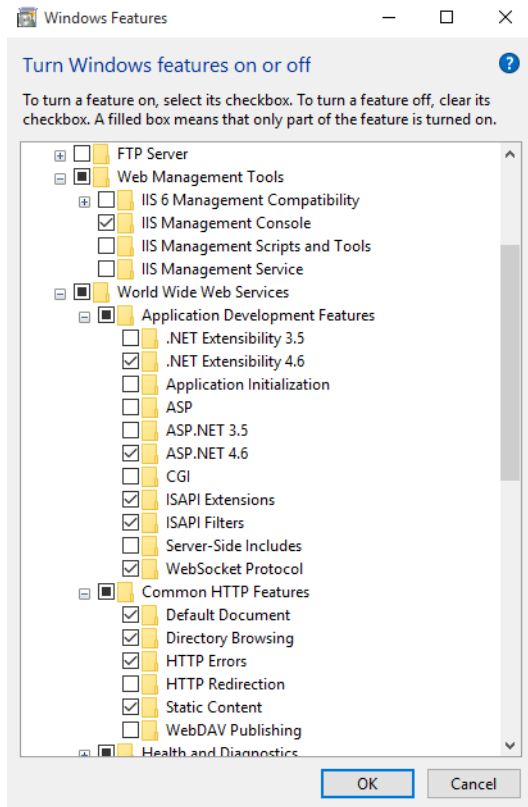


The window with the programs and features from the Control Panel opens.

3. In this window on the left, click on Turn Windows features on or off.



A new window with Windows features opens.



1. Expand the **Internet information services** in this node.
2. Activate all **World Wide Web Services** there.
3. Expand the **Application development features** node.
4. Activate **ASP.NET 4.6**
5. Expand the **Web administration tools** node.
6. There, activate the **IIS administration console**.
7. Click on **OK**.

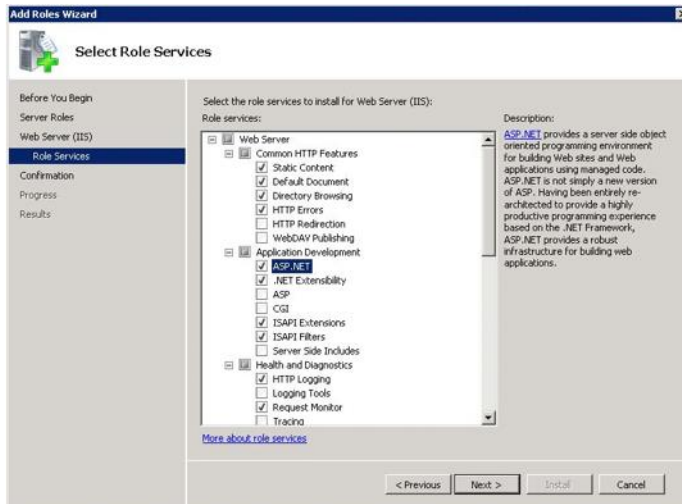
**Note:** The **WebSocket** protocol must be activated.

## WINDOWS SERVER 2008 R2

Follow the instructions from Microsoft: <https://technet.microsoft.com/en-us/library/cc771209.aspx>

1. Open the **Add roles** assistant.
2. Activate the **Web Server (IIS)** role

The **Add roles** assistant opens.



3. Click on **Role services**.
4. Expand the **Application development features** node.
5. Activate the following role services:
  - ▶ ASP.NET
  - ▶ .NET expandability
  - ▶ ISAPI extensions
  - ▶ ISAPI filter

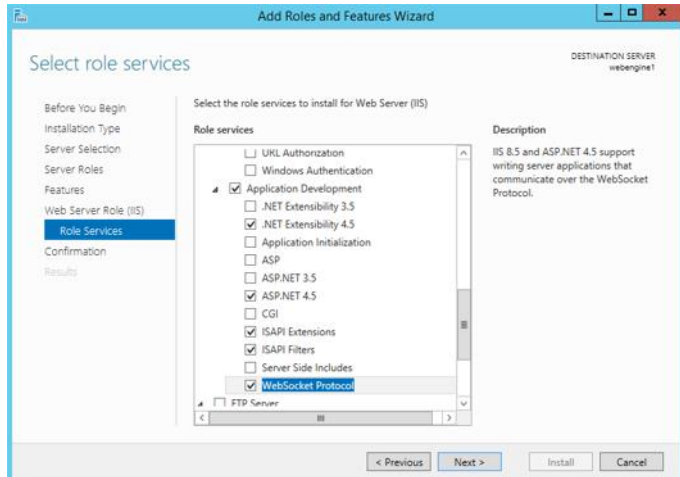
Do not deactivate any role services that have already been pre-selected by Microsoft.

**Note:** Use of Windows Server 2012 is recommended, because Windows Server 2008 R2 does not support WebSocket protocols.

## WINDOWS SERVER 2012 (R2)

Follow the instructions from Microsoft: <https://technet.microsoft.com/en-us/library/hh831475.aspx>

1. Open the **Assistant to add roles and features** wizard.



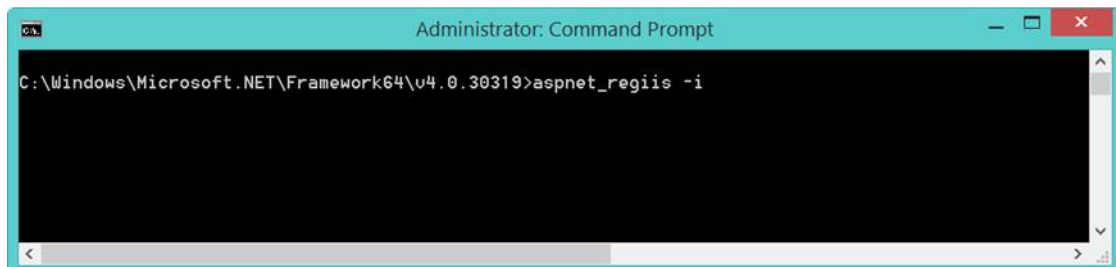
2. Expand the **Application development** node.
3. Activate the following role services:
  - ▶ NET expandability 4.5
  - ▶ ASP.NET 4.5
  - ▶ ISAPI extension
  - ▶ ISAPI filter
  - ▶ WebSocket protocol

## .NET registration on IIS under Windows 7

In the event of a subsequent installation or upgrade of the .NET framework under Windows 7, it is necessary to register with the IIS publishing service.

To do this:

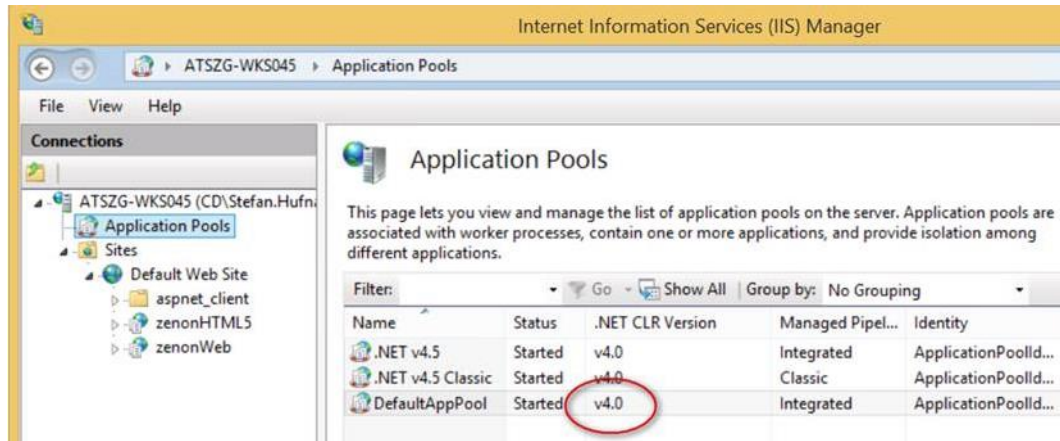
1. Open the Windows command prompt as an administrator.
2. Switch to the highest version number of the Microsoft.NET installation directory.
3. Enter command `aspnet_regiis -i`.



After successful registration, the current Microsoft .NET version is available for use with IIS.

4. Ensure that the application pool on the IIS in which the web engine is operated uses the current .NET version.

This can be checked and set with the Internet Information Services Manager:



## 4.6 SCADA Runtime Connector

A separate SCADA Runtime Connector session is set up for each HTML web engine session. The variables that are needed for the current screen display on the HTML client, for example for the display of variable values or element dynamics, are transferred. Variables can be registered and deregistered for a session. Once the user has been authenticated successfully for an HTML web client, the HTML web engine reports a list of variables for communication and spontaneous updating by means of the SCADA Runtime connector. The HTML web engine can thus forward value changes to the web clients that are currently connected.

**Note:** Only variables that are needed for display on the HTML web clients are reported. Variable values are only updated if required (spontaneously).

The writing of a set value is also executed by means of the SCADA Runtime connector. In doing so, to increase security before a value change, an explicit check of the authenticity is carried out with zenon Runtime on the basis of the user data of the HTML web client. A block or removal of users by zenon Runtime becomes effective for the writing of set values immediately.

The SCADA Runtime Connector must also be started by zenon Runtime, as soon as interaction with the HTML web engine is required. The interaction starts with the user authentication for the first HTML web client.

The SCADA Runtime connector is also installed when zenon is set up.

The SCADA Runtime connector can be started manually. To do this, start the application from the following directory: `C:\Program Files (x86)\Common Files\COPA-DATA\Connectors\zrsConnector.exe`

**Note:** You can read more information on the SCADA Runtime connector in the data preparation, level 1, data abstraction.

## 4.7 Client authentication for a connection to Runtime

Runtime data from zenon Runtime, such as variable values for display or for display dynamics, are only provided if the HTML client can authenticate itself to zenon Runtime. This can happen in two ways by providing a user name and password:

- ▶ Automatic login by configuring a user as part of deployment. For more details, see the Deployment of the Web Engine (on page 75) chapter.
- ▶ Manual login by the web client in a `login` screen. For details, see the Create `login` screen chapter.

**Note:** Authentication can be carried out by transferring the login data (user name and password) for a zenon user or an Active Directory user. The user data is validated by zenon Runtime.

## 4.8 Deployment of the Web Engine

The Deployment Tool offers important operations in order to administer the Web Engine as a web application on the Internet Information Services (IIS) for the visualization application.

To start the deployment tool, proceed as follows:

1. Open the zenon Startup Tool.
2. click on the **Tools** button.
3. Select, under **Available Application**, the `Web Engine Deployment Tool` .

By clicking on the **Deploy to IIS with configured security settings** option, the tool installs and configures the HTML Web Engine on the Internet Information Services.

Note: The deployment tool is automatically installed with the zenon Web Server. Administrator rights are required for the use of this tool. The deployment tool is only available in English.



If you want to replace the web engine by a more recent version, first uninstall a running instance by selecting the **Remove** option.

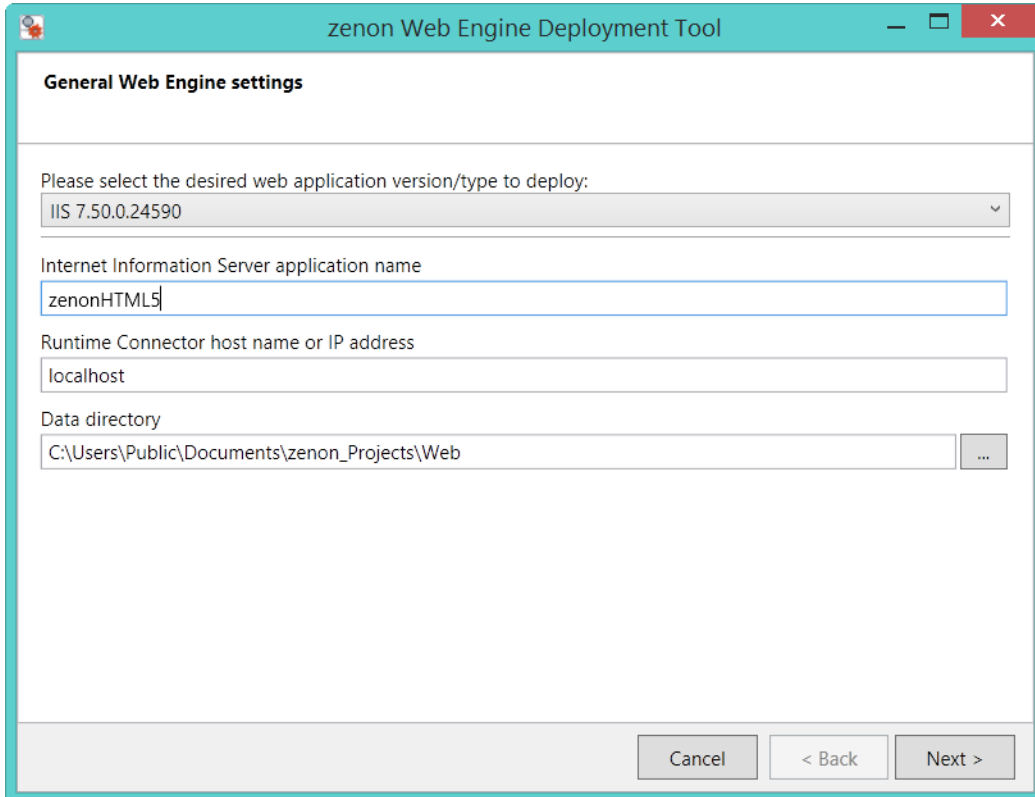
#### 4.8.1 Deploy: Providing the HTML Web Engine on the IIS

The Web Engine must be provided as a web application on the IIS so that it can take on this role. By clicking on the **Deploy to IIS with configured security settings** option, you get to the next tabs, in which you can change the settings.



## General settings for the Web Engine

In this tab, you configure the general settings for the operation of the HTML web engine.



The screenshot shows a window titled "zenon Web Engine Deployment Tool" with a teal header bar. Inside, the "General Web Engine settings" tab is active. The settings are as follows:

- Please select the desired web application version/type to deploy:** A dropdown menu with "IIS 7.50.0.24590" selected.
- Internet Information Server application name:** A text box containing "zenonHTML5".
- Runtime Connector host name or IP address:** A text box containing "localhost".
- Data directory:** A text box containing "C:\Users\Public\Documents\zenon\_Projects\Web" with a browse button ("...") to its right.

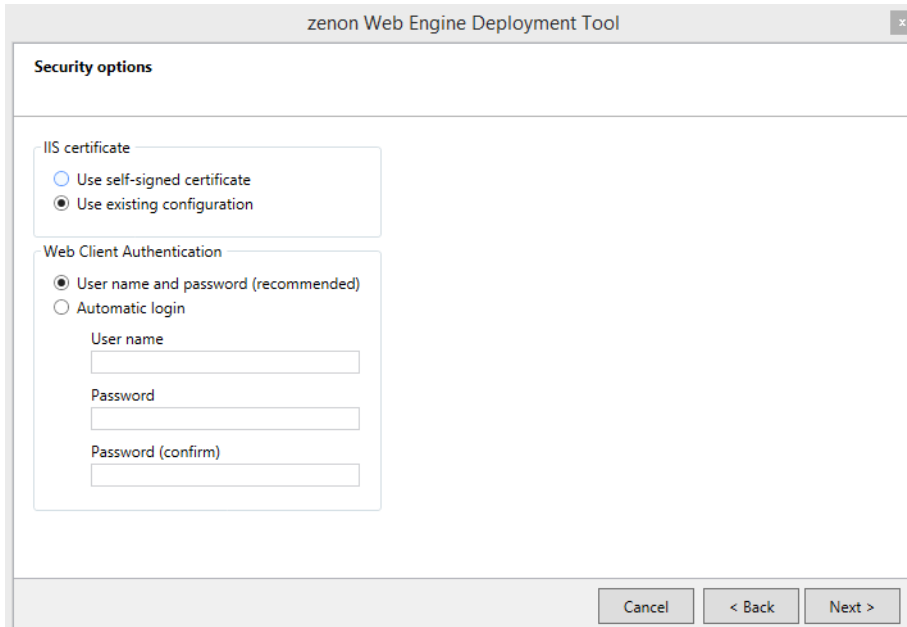
At the bottom right, there are three buttons: "Cancel", "< Back", and "Next >".

The following fields are to be configured:

Field name	Required information
<b>Please select the desired web application version/type to deploy:</b>	Select the desired version of the web engine.
<b>Internet Information Server application name</b>	Enter a desired name for the web application. This name will be a part of the URL under which the HTML5 web page will later be reached. Example: https://ServerAddress/<ApplicationName>
<b>Runtime Connector host name or IP address</b>	Enter the host name or the IP address of the computer on which the zenon Runtime and the SCADA Runtime Connector are installed.
<b>Data directory</b>	<p>Here you enter the directory from which the Web Engine is to read the exported project data.</p> <p><b>Note:</b> The webx file generated by the web engine computer must subsequently be available in this directory. The first webx file is loaded into the file list when the HTML web engine (web server) is started up. If the webx file loaded by the web engine is amended or deleted, the web engine automatically restarts and in turn loads the first webx file in the folder.</p> <p><b>Default directory:</b> C:\Users\Public\Documents\zenon_Projects\Web</p>
<b>Cancel</b>	Discards changes and closes the dialog.
<b>Back</b>	Goes back one tab in the tool.
<b>Next</b>	Goes forward one tab in the tool.

## Security settings

In this tab, you configure the security settings for the operation of the HTML web engine.



The screenshot shows a window titled "zenon Web Engine Deployment Tool" with a tab labeled "Security options". Inside the window, there are two main sections:

- IIS certificate**: Contains two radio buttons: "Use self-signed certificate" (unselected) and "Use existing configuration" (selected).
- Web Client Authentication**: Contains two radio buttons: "User name and password (recommended)" (selected) and "Automatic login" (unselected). Below these are three text input fields: "User name", "Password", and "Password (confirm)".

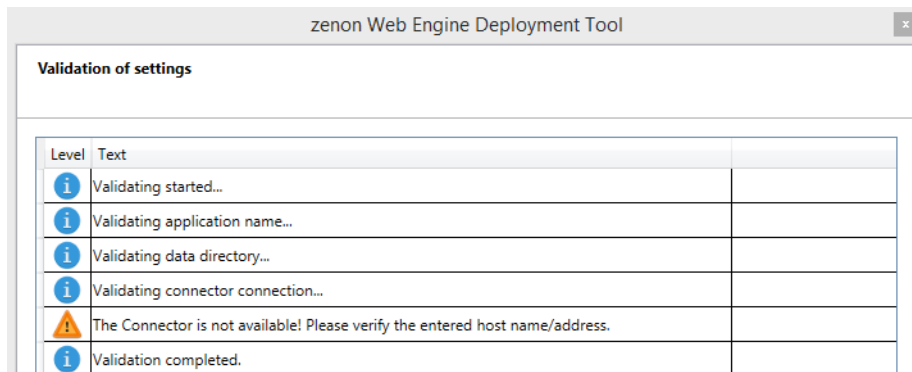
At the bottom of the window, there are three buttons: "Cancel", "< Back", and "Next >".

You select between two options each time:

Parameters	Description
<b>IIS certificate</b>	<p>In this area, you define whether you want to create a self-signed certificate by the deployment tool or whether you want to use a pre-existing certificate.</p> <p><b>Note:</b> A security certificate is a mandatory requirement for communication between the web server and web client.</p>
<b>Use self-signed certificate</b>	<p>Activate this option if you want to create a temporary, self-signed certificate.</p> <p><b>Note:</b> This option is mandatory if there is no certificate present on the IIS.</p>
<b>Use existing certificate</b>	<p>This option can be selected if there is already a valid certificate on the system.</p> <p><b>Note:</b> Use of an official certificate from a certification body is recommended.</p> <p><b>Possible certification body:</b>  <a href="https://www.digicert.com/ssl-certificate-installation-microsoft-iis-8.htm">https://www.digicert.com/ssl-certificate-installation-microsoft-iis-8.htm</a></p>
<b>Web Client Authentication</b>	<p>In this area, you define how the authentication of the web client is to be carried out.</p>
<b>User name and password (recommended)</b>	<p>The web client is authenticated by manual entry of the user name and password.</p> <p><b>Note:</b> The user name and password must be entered in a zenon <b>login</b> screen.</p>
<b>Automatic login</b>	<p>Activate this option if you want the web engine to automatically establish a connection to zenon Runtime. The given user data is used for authentication.</p> <p><b>Attention:</b> When this option is used, each web client receives a connection to zenon Runtime.</p>
<b>User name</b>	Enter the desired user name here.
<b>Password</b>	Enter the user password here.
<b>Password (confirm)</b>	Enter the user password again.
<b>Cancel</b>	Discards changes and closes the dialog.
<b>Back</b>	Goes back one tab in the tool.
<b>Next</b>	Goes forward one tab in the tool.

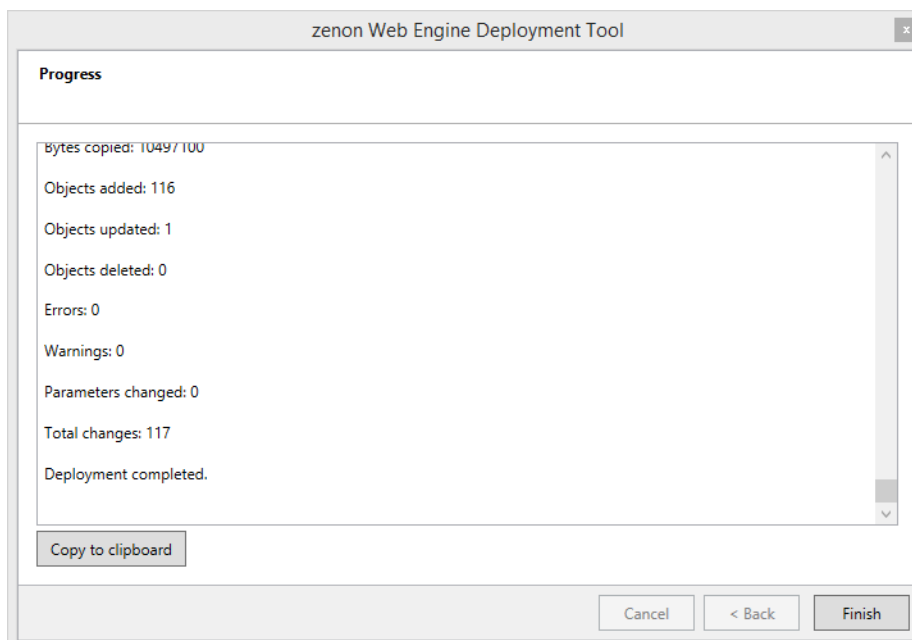
## Validation of the settings

The settings are validated in this tab. The result of the validation is shown in a list.



## Progress

In this tab, you see the progress of the Web Engine deployment on the IIS.



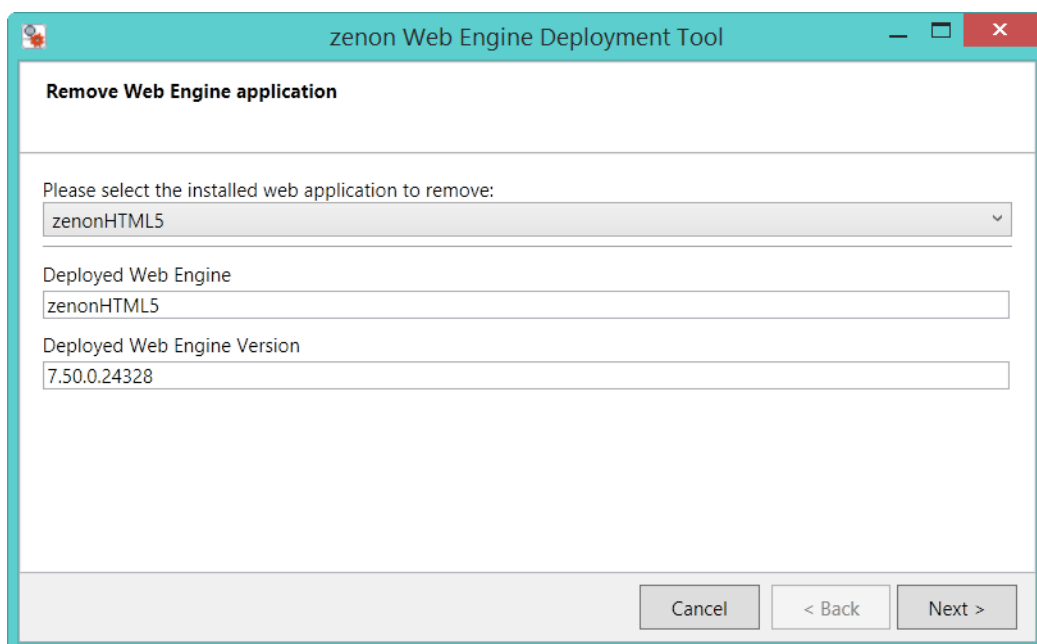
- Once the procedure has been completed, click on the **Finish** button to close the deployment tool.

#### 4.8.2 Remove: Remove the running instance of the HTML web engine from IIS

If you want to remove a running instance of the web engine or replace it with a more recent version, uninstall the pre-existing instance by selecting the **Remove** option.



You then get to this tab:



In the fields, you see the following information about the web engine that you want to remove.

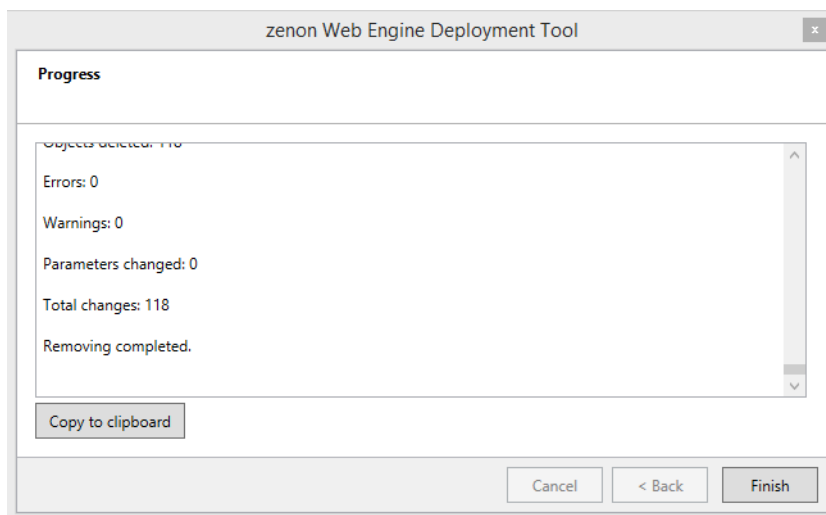
Field name	Information
Please select the installed web application to remove.	Selection of the web engine instance that is to be removed from IIS.
Deployed Web Engine	The name of the existing Web Engine instance (Web Application) on the IIS.
Deployed Web Engine Version	The version number of the existing Web Engine instance (Web Application) on the IIS.
Cancel	Discards changes and closes the dialog.
Back	Goes back one tab in the tool.
Next	Goes forward one tab in the tool.

- Click on the **Next** button to get to the next tab.

## Progress

In this tab, you see the progress of the removal of the existing Web Engine instance.

**Note:** You copy the progress information to the clipboard by clicking on the **Copy to clipboard** button. You can use this to document the information if necessary.



- Click on the **Finish** button to end the process.

## 4.9 Engineering in the Editor

The data required by the Web Engine for HTML5 visualization is created from a zenon standard project. The zenon Editor must be open for this.

You have multiple options to start the Editor:

- ▶ Click on the zenon symbol on your desktop.
- ▶ Use the Windows menu file -> COPA-DATA -> zenon Editor.
- ▶ Start using the Startup Tool. This tool allows the administration of multiple versions of zenon and the configuration of the Editor and the Runtime before you start.
- ▶ Using Windows Autostart.
- ▶ Double click on a workspace file (**.wsp6**). The 32-bit version of the zenon Editor is thus always opened.

**Note:** When configuring the HTML5 visualization, note the supported properties, screen elements and functions of the HTML web engine.

## CREATE PROJECT

For HTML5 visualization with the zenon web server, create a standard zenon project. You can also use certain resources from a global project for this. You can read how to create a project in the Creating a new project chapter.

### 4.9.1 Supported functionalities for HTML5 visualization

For HTML5 visualization, basic elements, properties and functions can be used, including:

#### VARIABLES:

- ▶ Variables of each type can be used to configure value displays and display dynamics. The writing of set values to the HTML web client is supported.
- ▶ Variable limit values for the dynamic aspects of the element display (limit value color, limit value text) are fundamentally supported.

#### FONT TYPES AND FONT LISTS.

- ▶ Selection and display of any desired font lists that are available on the system.

**Note:** Selected font types must be available on both the project configuration computer and on the web client. The steps must be defined in the local project.

- ▶ Display in `Normal` font style, `italic` and `bold`.
- ▶ Selection and display of the font in accordance with the font list.
- ▶ Online switching of the font list.

**Note:** The first font list of the zenon project is shown when a session starts

## SCREENS AND FRAMES:

### FRAME:

- ▶ Calling up rectangular frames at an absolute position.

### SCREENS, GENERAL:

- ▶ Display of screens in the size of the linked frame.
- ▶ Display of background color and background graphics.
- ▶ Execution of a start and end function.

### STANDARD SCREEN:

- ▶ Display of this type of screen.

### LOGIN SCREEN:

- ▶ Display of this type of screen.
- ▶ User authentication with the screen-type-specific elements **Enter user name** and **Enter password** or **Login** command.

### AML SCREEN TYPE: (ON PAGE 91)

- ▶ Display of this type of screen.
- ▶ Display of static AML lists. Static means the the data displayed is not updated.

### CEL SCREEN TYPE: (ON PAGE 91)

- ▶ Display of this type of screen.
- ▶ Display of static CEL lists. Static means the the data displayed is not updated.

### HTML SCREEN TYPE: (ON PAGE 89)

- ▶ Display of this type of screen.
- ▶ Display of the element specific to the screen type, such as web browser

### STATIC SCREEN ELEMENTS:

- ▶ Basic support of element-specific display options (display, color and fill options, no effects).

- ▶ Basic support of display dynamics using variables (color and position dynamics).

The following are supported:

- **Line**
- **Rectangle**
- **Circle**
- **Arc of a circle**
- **Segment of a circle**
- **Polygon**
- **Polyline**
- **Static text**

#### **GENERAL SCREEN ELEMENTS:**

- ▶ Basic support of element-specific display options (display, color and fill options, no effects).
- ▶ Basic support of display dynamics using variables (color and position dynamics).

#### **BUTTON:**

- ▶ Execution of functions of the local project.

**Note:** The corresponding user level is checked for the execution of the action.

#### **NUMERICAL VALUE:**

- ▶ Write set value with dialog, taking into account static setpoint limits.

**Note:** The corresponding user level is checked for the execution of the action.

#### **DYNAMIC TEXT:**

- ▶ Display of the variable information `variable value`, `variable name`, `variable identification`, `resources label`, `Measuring unit` and `limit value text` are possible.
- ▶ Write set value with dialog.

**Note:** The corresponding user level is checked for the execution of the action.

## ELEMENT GROUPS AND SYMBOLS:

### ELEMENT GROUP:

- ▶ Display of element groups.
- ▶ The elements contained are displayed in accordance with their configuration and supported properties.

### LINKED SYMBOL:

- ▶ Display of linked symbols.
- ▶ Support for `replace linking` for application in the screen, whereby resulting entries must refer to resources in the local project.
- ▶ The elements contained are displayed in accordance with their configuration and supported properties.

### SCREEN SWITCH FUNCTION:

- ▶ Calling screens of the local project.
- ▶ Support for `replace linking`, whereby resulting entries must refer to resources in the local project.

### CLOSE FRAME FUNCTION:

- ▶ Closing of frames with the given frame name.

### WRITE SET VALUE FUNCTION:

- ▶ Direct writing of pre-defined variable values.

### LANGUAGE SWITCH FUNCTION:

- ▶ Online switching of **language file** and **font list**.

### SWITCH COLOR PALETTE FUNCTION

- ▶ Online switching of the **color palette** for graphic display.

**EXECUTE SCRIPT FUNCTION:**

- ▶ Execution of functions of the local project. Non-supported functions are excluded from execution.

**LOGOUT FUNCTION:**

- ▶ Logging a user out of a web client session and disconnecting from zenon Runtime
- ▶ The web client session is continued in offline mode

**GLOBAL PROJECT:**

The HTML export takes the use of the following resources from a **global project** into account:

- ▶ **Frames**
- ▶ **Color palettes**
- ▶ **Language Files**

**Example: Simple start screen**

Check the functionality of the HTML web engine with a simple example.

To do this:

1. Create a `standard` screen.
2. Activate the **Available in web** property in the group **General** for this screen.
3. Enter this screen as a **start screen** in the project properties under **Graphical design**.  
**Note:** Any desired start page can be defined for the web by using the autostart script
4. Add simple elements to the screen, for example a rectangle, circle or static text.
5. Ensure that the current project is set as a start project.

After these steps, you can continue with the Exporting of the project steps for HTML5 visualization.

**EXTENSION: AUTHENTICATION WITH LOGIN**

In order to be able to exchange data with zenon Runtime, the web client must be authenticated as a user to Runtime. You can read more details about this in the following chapter: Client authentication for a connection to Runtime (on page 75). For manual authentication, extend your project as follows:

1. Add a dynamic element to display a variable value, for example `dynamic text` or `numeric value`. Assign this element a variable from the project.

**Note:** Variable values can also be used for position or color dynamics of an element.

2. Create a new `login` that you can display in the visualization. You can use the `screen switch` function for this.
3. Activate the **Available in web** option under **General** for the screen.
4. In the `login` screen, add the elements **user name**, **password**, **login** and/or **Cancel**.

### Login

Current user:  
Current user:  
Type: `STATIC`

User identification  
User identification  
Type: `EDIT`

Static text  
Element name: `s`

Password  
Password  
Type: `EDIT`

Login Cancel

5. Carry out the HTML export for the current project.

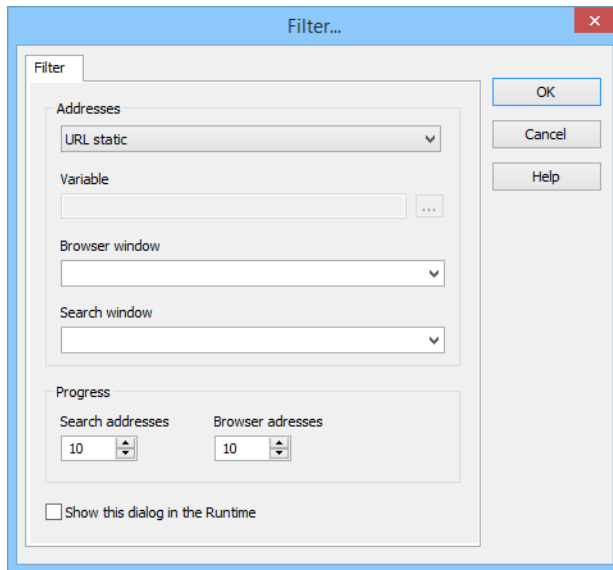
The web client now has the possibility to carry out authentication by means of entry of the user data. If authentication is successful, a connection to zenon Runtime is established. As a result of this, variable values for HTML5 visualization are available, for example.

## Creating a screen of the type HTML

To create a screen of type `HTML`:

1. Create a new screen
2. Select the screen type from the `HTML` drop-down menu
3. Activate the **Available in web** property in the group **General** for this screen.
4. Note the options for opening external web pages (on page 90).

5. Create a screen switch function in order to be able to call up the screen in Runtime.



The following functionalities are supported by the HTML web engine in the tab shown.

Parameters	Description
<b>URL static</b>	The URL is set as static. Note: This setting is mandatory.
<b>Browser window</b>	Enter the complete URL of the external web page here (including <code>https://</code> ). Example: <code>https://serveraddress</code>

### Options for opening external web pages

The opening of external web pages is supported by the HTML web engine either by means of an embedded browser or as a new browser window.

#### Embedded browser window:

To see an embedded browser window that you have entered in the screen switching function from the URL in Runtime:

- In the **Control elements** menu, select the **Browser**, then **Browser window** options.
- Draw the frame for the browser window in the screen. The given website (URL) is displayed in this frame.

**Note:** The opening of the embedded display (iFrame) only works if the X-Frame options on the remote server are configured accordingly. In addition, the address of the embedded web page must also be available for HTTPS via the HTTPS connection between the HTML web engine and HTML web client.

New browser window:

To open an external web page in a new browser window:

- ▶ Delete the browser window control from the inserted template in the screen.

The external web page is opened in a new browser window if there is no browser window control in the screen.

**Note:** The calling up of several URLs is supported via script. However some browsers prevent tabs being called up with their pop-up blocker. In such cases, a dialog appears with the URLs that cannot be called up. These URLs can be opened manually.

### **Screen types AML and CEL: Supported functionalities**

The AML and CEL screen types support the following functionality:

**FILTER AND GENERAL DISPLAY OPTIONS (CONFIGURED IN THE SCREEN SWITCHING FUNCTION)**

Tab	Group	Settings and notes
<b>General</b>	<b>Variable filter</b>	<ul style="list-style-type: none"> <li>▶ Variable name</li> <li>▶ Identification</li> </ul> <p>Note: Capitalization is not taken into account here.</p>
	<b>Alarm type (AML only)</b>	<p>Options:</p> <ul style="list-style-type: none"> <li>▶ Only non-acknowledged alarms</li> <li>▶ Only cleared alarms</li> <li>▶ Only current alarms</li> </ul>
	<b>Origin of the data</b>	Only historical data of zenon Runtime.
	<b>Runtime settings</b>	<p>Static display of the list:</p> <ul style="list-style-type: none"> <li>▶ Display of the list entries of zenon Runtime at the time of screen switching.</li> </ul>
<b>Time</b>	<b>Filter</b>	<p>Options:</p> <ul style="list-style-type: none"> <li>▶ No time filter</li> <li>▶ Absolute time period</li> <li>▶ Relative period of time</li> </ul>
	<b>Settings</b>	Only the Preset option.
<b>Column settings</b>	<b>Columns</b>	<ul style="list-style-type: none"> <li>▶ Time received</li> <li>▶ Time cleared (AML only)</li> <li>▶ Time acknowledged (AML only)</li> <li>▶ Text</li> <li>▶ Variable name</li> <li>▶ Value</li> <li>▶ Measuring unit</li> <li>▶ User - full name</li> <li>▶ Computer name</li> <li>▶ Comments (AML only)</li> </ul> <p>Note: The set display sequence is taken into account as follows.</p>

		The column description can be edited. Language switching is supported.
	<b>Table settings</b>	<p><b>Always active:</b></p> <ul style="list-style-type: none"> <li>▶ Use alternating background colors</li> <li>▶ Display grid</li> <li>▶ Sort descending</li> </ul> <p><b>Note:</b> Color palette switching is supported for:</p> <ul style="list-style-type: none"> <li>▶ Row color 1</li> <li>▶ Row color 2</li> </ul>
<b>Equipment Modeling</b>		<ul style="list-style-type: none"> <li>▶ From local and global project.</li> </ul>

#### GRAPHICS SETTINGS OF THE ALARM MESSAGE LIST CONTROL ELEMENT

Parameters	Description	Settings and notes
<b>Header and grid</b>	<b>Header</b>	<p><u>Always active:</u></p> <ul style="list-style-type: none"> <li>▶ Show header</li> </ul> <p><u>Always standard:</u></p> <ul style="list-style-type: none"> <li>▶ Display style</li> </ul> <p><u>Background color:</u></p> <ul style="list-style-type: none"> <li>▶ Fill color</li> </ul> <p>Fill color is also in the footer in the web Applied:</p> <ul style="list-style-type: none"> <li>▶ Static/fixed color.</li> <li>▶ Color palette and switching of color palettes.</li> </ul> <p>Font is also in the footer in the web Applied:</p> <ul style="list-style-type: none"> <li>▶ Static selection.</li> <li>▶ Switching of font lists.</li> </ul> <p>Text color is also in the footer in the web Applied:</p>

		<ul style="list-style-type: none"> <li>▶ Static/fixed color.</li> <li>▶ Color palette and switching of color palettes.</li> </ul>
<b>Fill</b>	<b>Fill/text color</b>	<ul style="list-style-type: none"> <li>▶ Static/fixed color</li> <li>▶ Color palette and switching of color palettes</li> </ul>
<b>Display</b>	<b>Display</b>	<ul style="list-style-type: none"> <li>▶ Static selection</li> <li>▶ Switching of font lists</li> </ul>

### Automatic script call when starting a web client session

A script can be called up automatically when starting an HTML web client session.

The following script name is reserved for this:

- ▶ AUTOSTART\_HTML\_WEBCLIENT

**Note:** This script is executed whenever a session of an HTML web client starts. The name of the script must not be changed.



#### Example

The automatic script call-up can, for example, be used in order to stipulate a special home page for the web application.

### Individual script call by means of URL expansion when starting a web client session

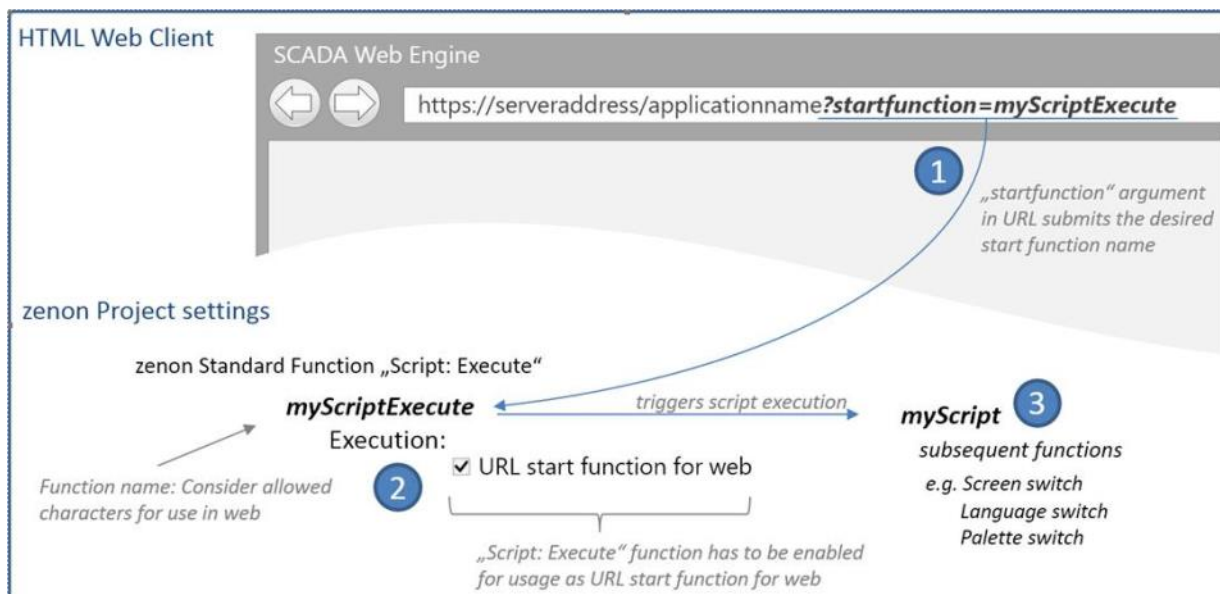
The HTML web engine allows the individual execution of zenon functions as part of a session start for an HTML web client. In doing so, the function is executed by a script and the corresponding `script` function: `Execute`. The name of the desired start function can be transferred by the `startfunction` argument in the URL for the call-up of the website. To do this, the function for the execution of the script must be explicitly approved for call-up as a URL start function.

**Note:** All settings that are required for the use of the URL start function must be set in the project at the time of the conversion (compilation for web).

Process for the application of the functionality:

1. The web page is called up with the additional argument for the call of the desired `script` function: `Execute`. The call is made using the function name.

2. and 3.) If the function for the use as a URL start function has been approved, the assigned script is executed. The execution of the script is carried out individually for this HTML web client session. If the addressed function does not exist or has not been unlocked, a standard web page call is made. The session is then set up according to the call without `startfunction` argument.



Note: This screenshot is only available in English.

The following limitations are applicable for use of the function name in the web:

Character	Permitted
Alphanumeric characters, (0-9, a-z, A-Z, no umlauts), \$ - _ . + ! * ' ( ) , comma	Yes
ASCII control characters (0x00-0x1F;0x7F)	No
Reserved characters & / : ; ? @	No
Our characters, for example space, quote marks < , > , # , % , { , } , ! , \ , ^ , ~ , [ , ]	No

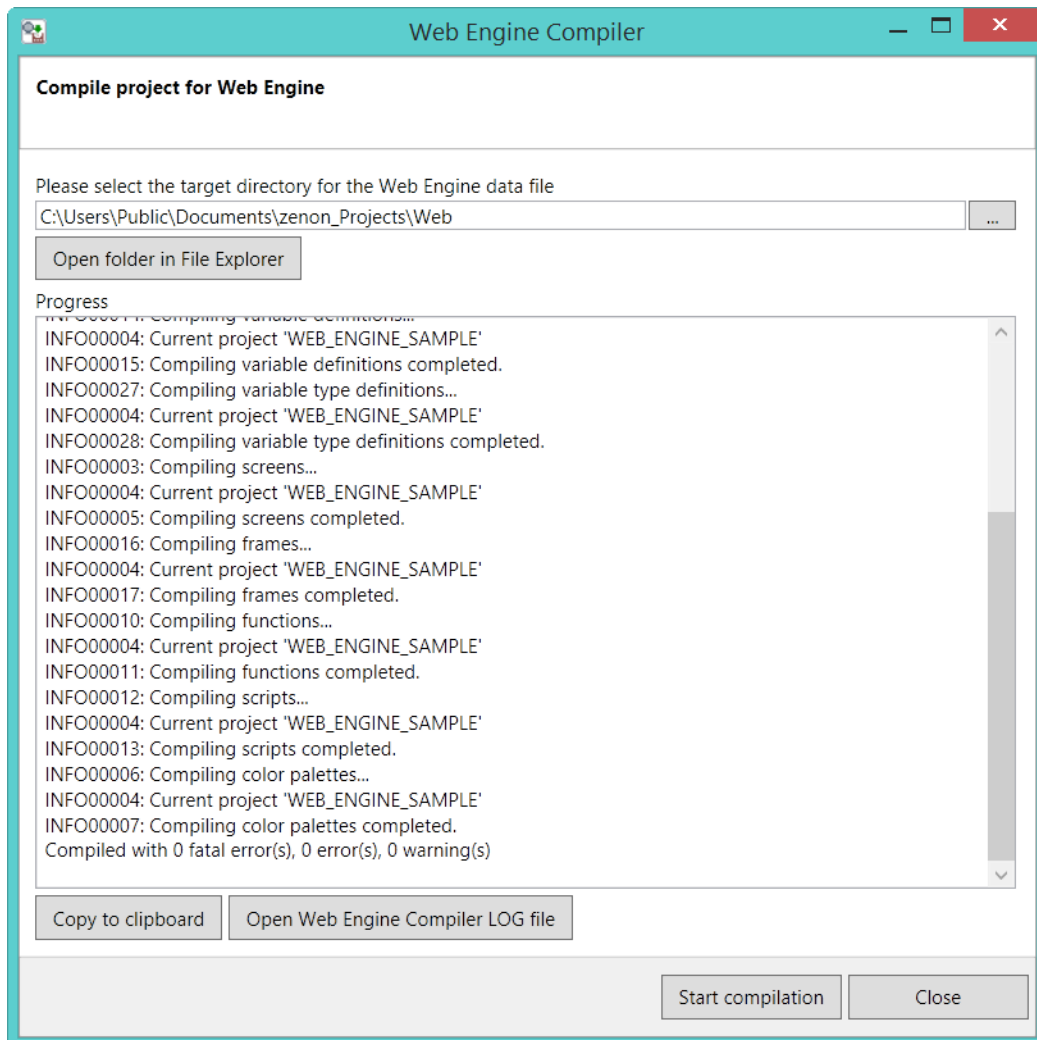
## 4.10 Compile project for web

With the web engine compiler, the data that the HTML web engine needs to provide content for the web client is generated from a zenon project. When translating this project data, the web engine compiler checks the project contents and provides information on non-supported functions or properties. As a result of the translation process, a file is created that is provided to the web engine.

To open the web engine compiler:

1. Click on **Options** in the menu bar of the Editor.
2. Click on **Compile project for web...**

The following dialog opens:



The following fields can be seen in the dialog:

Parameters	Description
Please select the target directory for the Web Engine data file	Select a directory to save the web engine file here.
Open folder in File Explorer	Opens the folder in Windows Explorer.
Progress	Shows warnings, error messages and information.
Copy to clipboard	Copies the content of the output window to the clipboard.
Open Web Engine Compiler LOG file	Opens the web engine compiler log file.
Start compilation	Starts the compilation process.
Close	Closes the web engine compiler.

## 4.11 Course of an HTML web engine session

The HTML visualization is available after a successful compilation of the project data. To call up the web site, proceed as follows:

1. Open an HTML 5-compatible web browser. You can find the list of recommended web browsers in the System requirements (on page 64) chapter.
2. Enter the following web site URL into the address bar of the web browser for the HTML5 visualization: **https://ServerAddress/<ApplicationName>**.

The HTML 5 content is provided automatically. In doing so, a separate session is created and administered for each web client. The runtime data of zenon Runtime is available as soon as you have been successfully authenticated as a user. You can read more details about this in the Client authentication for a connection to Runtime (on page 75).

3. As soon as you leave the web page, the HTML web engine session and the connection to zenon Runtime is disconnected automatically.

**Note:** The web page is left when the web browser is closed, its tab, updating the view or entering the URL again (among other things).

## 4.12 General notes

### SYSTEM DIAGNOSIS AND TROUBLESHOOTING

#### GENERAL AND DETAILED ERROR MESSAGES ON THE HTML WEB CLIENT:

If there are problems during a system start or during operation, error messages that provide information on the possible cause of the problem are given in the HTML web client. You get detailed messages if you call up the HTML5 web page from a local web browser - that means that the web browser runs on the same computer (IP address) on which the web engine is also operated. General messages are displayed on HTML web clients that call up the HTML5 web page remotely from a different device.

#### CHECKLIST FOR ERROR-FREE SYSTEM OPERATION:

The following checks are recommended for general checking of the system configuration:

- ▶ HTML web engine was installed on the IIS. The web engine deployment was carried out without any errors. The web server is in operation.
- ▶ Visualization data was created with the web engine compiler. There are no errors during the compilation process. The resultant data of the web engine compiler is ready for access by the web engine.  
**Note:** The presence of warnings does not in principle influence the ability of the HTML web engine to run. However there can be limitations to the configured functionality depending on the type of warning
- ▶ Versions of the web engine compiler and HTML web engine are identical.  
**Note:** The data created by the web Engine Compiler can only be interpreted correctly by the HTML web engine (web application) with the same version number.

#### FOR THE TRANSFER OF PROCESS DATA:

- ▶ zenon Runtime and Runtime connector have been started. The Runtime connector can be contacted via the network.  
**Note:** The processes for zenon Runtime and SCADA Runtime connector must run in the same user context.
- ▶ Users who need to be authenticated must be available in zenon Runtime.