



zenon
by COPA-DATA

zenon manual

zenon Web Server.

v.8.10



COPADATA

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1 Welcome to COPA-DATA help

ZENON VIDEO-TUTORIALS

You can find practical examples for project configuration with zenon in our YouTube channel (https://www.copadata.com/tutorial_menu). The tutorials are grouped according to topics and give an initial insight into working with different zenon modules. All tutorials are available in English.

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.

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.

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.

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 can be applied.

Note: When the zenon web server is restarted, all connected zenon web clients lose the connection. The zenon Web Clients will automatically reconnect after the set timeout.

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:

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: Projects with redundancy cannot be executed with the zenon Web Server Pro Light.
- ▶ 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 Licensing

For licensing, follow the procedure to manage licenses in the **Licensing** manual.

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



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.

3.2 Example of configuration with zenon Web Server:

The configuration in this example is only a recommendation. You are free to decide which components are installed on which computer.

Note: A zenon Web Client for a project **A** cannot be used on a computer that is the server for project **A**.



Information

The zenon Web Server must have a valid license.
If this is not the case, start it in demo mode.

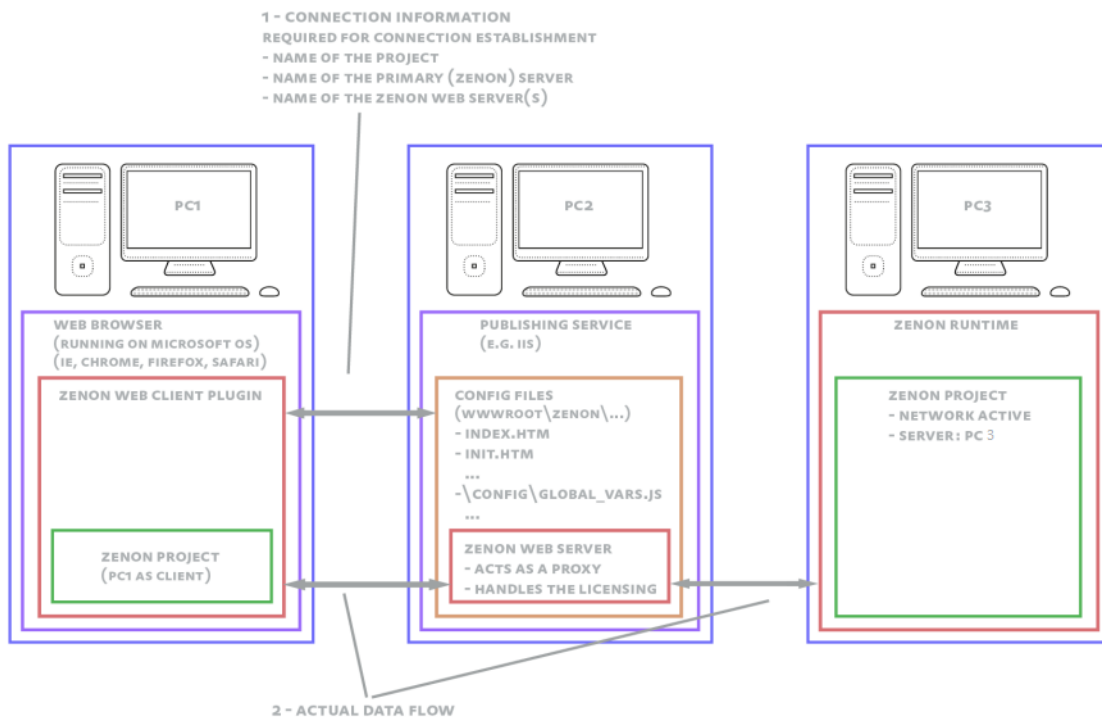
Limitations in demo mode:

- ▶ No automatic start with the operating system.
The zenon Web Server must be started manually via the user interface.
- ▶ The connection is automatically ended after 30 minutes.
- ▶ A maximum of 2 clients can connect to it.

The configuration is intended to enable:

- ▶ Connection of **PC1** as the Client to the Primary Server **PC3**.
- ▶ The connection is established via the zenon Web Server on **PC2** as the gateway.
- ▶ The project of **PC3** is displayed in a Web browser on **PC1** with the help of the zenon Web Server and the zenon Web Client.
For this, no additional local installation of the Runtime is required on **PC1**.

The following installations are necessary for this function:



IMPORTANT NOTES

ALSO OTHER CONFIGURATIONS ARE POSSIBLE DEPENDING ON THE CIRCUMSTANCES/ENVIRONMENT/LICENSING

- THE PUBLISHING SERVICE (HOSTING THE CONFIG FILES) COULD BE INSTALLED ON ANOTHER PC THAN THE ZENON WEB SERVER
- THE ZENON WEB SERVER AND THE PUBLISHING SERVICE COULD BE INSTALLED ON THE SAME PC AS THE PRIMARY (ZENON) SERVER (MUST BE INSTALLED ON THE SAME PC FOR ZENON WEB SERVER PRO LIGHT)
- THE WEB CLIENT (FOR THE SAME PROJECT) CANNOT RUN ON THE PC WHERE THE PRIMARY (ZENON) SERVER IS RUNNING
- THERE IS NO NEED FOR THE PUBLISHING SERVICE IF THE CONFIG FILES ARE AVAILABLE LOCALLY RESP. HOSTED SOMEWHERE ELSE (E.G. VIA A NET WORK SHARE) - ALTHOUGH USING THE PUBLISHING SERVICE IS THE MOST COMFORTABLE WAY

1. **PC1:** Install the following on this computer: **zenon Web Client** (on page 19) and the **Web Browser** (on page 43).
2. **PC2:** Install the following on this computer: **Publishing Service** (on page 10) and the **zenon Web Server** (on page 11).

Note: The term Publishing Service in this manual refers to the **IIS Publishing Service**. If the IIS Publishing Service is installed on the computer, the home page for the zenon Web Client is configured automatically.

You can also use alternative publishing services or entirely do without the publishing service. The configurations needed in this case can be found in the **Publishing Service** (on page 10) chapter.

3. **PC3:** The following must exist on this computer:
 - ▶ the **zenon Runtime**
 - ▶ the **Project**
 - ▶ optionally, the **zenon Editor**

Note: 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.

CONFIGURING THE COMPONENTS

Individual configurations are usually still necessary after each installation.

For example, the **global.vars** file must be configured after the zenon Web Server is installed on **PC2**. For details, read the **global_vars.js settings** (on page 15) chapter.

RUNTIME BASIC SETTINGS

The Runtime project on **PC3** requires the following basic settings (on page 34) in the project properties for **Network** in the zenon Editor:

- ▶ **Network active:** Activate by clicking the checkbox.
- ▶ **Server 1:** Enter the name of the computer with the Runtime.

DISPLAY RUNTIME

To display Runtime on **PC1**:

1. Open a Web browser.
2. Enter the following in the address line: **Computer namePC2\zenon\index.htm**

3.3 Required components and their definitions

Components	Description
Primary Server (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.
zenon Web Server (on page 5)	Forwards data packets from the Primary Server via the zenon Web Server to the zenon Web Client. Also handles licensing. Cannot write values.
zenon Web Server Pro (on page 5)	Allows active user actions with zenon Supervisor. Starting and operation with Windows CE is subject to certain limitations.
zenon Web Server Pro Light (on page 5)	Allows active user actions with zenon Operator and zenon Supervisor.
Publishing service (on page 10)	For publishing documents, such as HTML pages, via the

Components	Description
	HTTP protocol.
zenon Web Client (on page 19)	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.
Web browser (on page 43)	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: http://de.wikipedia.org/wiki/Webbrowser

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.

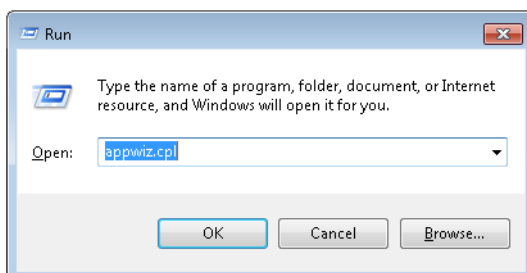
3.3.1 Publishing service installation

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:

1. Press the **Windows key + R** keyboard shortcut.

The dialog to enter a command for the command processing is opened.



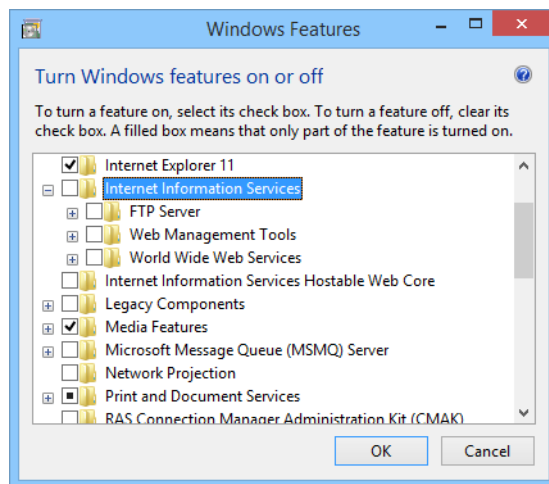
2. Enter *appwiz.cpl* in the input field.

Click on **OK**.

A new control panel window to configure programs and **Windows features** is opened.

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

The window to select features of the operating system is opened.



4. Expand 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 folder:
`\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 zenon 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.

3.3.2 zenon Web Server Installation

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

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

Hint: If the zenon Web Server is to be contactable from outside, it is strongly recommended that a VPN connection is used and the zenon 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

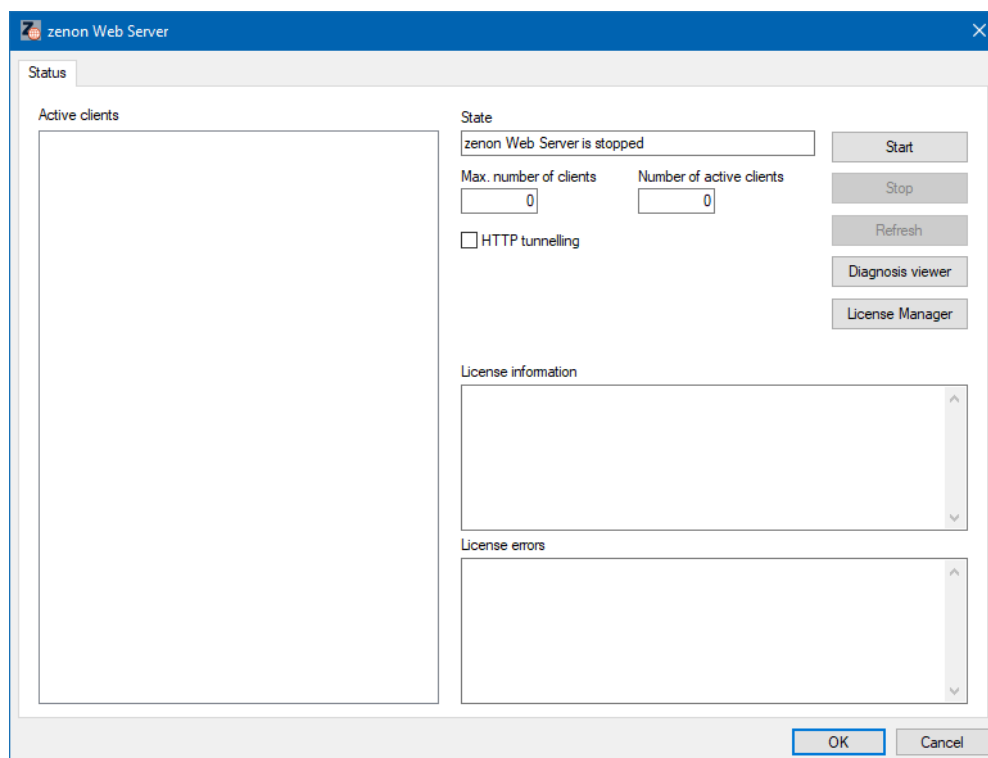
The *zenon* folder is automatically created in the **wwwroot** folder of the IIS publishing service. This folder contains, among other things, some important configuration files that must be installed. For example, *global_vars.js*. is an important file You must amend some settings in this file. Read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

3.3.2.1 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 6) opens:



Note: This dialog is only available in English.



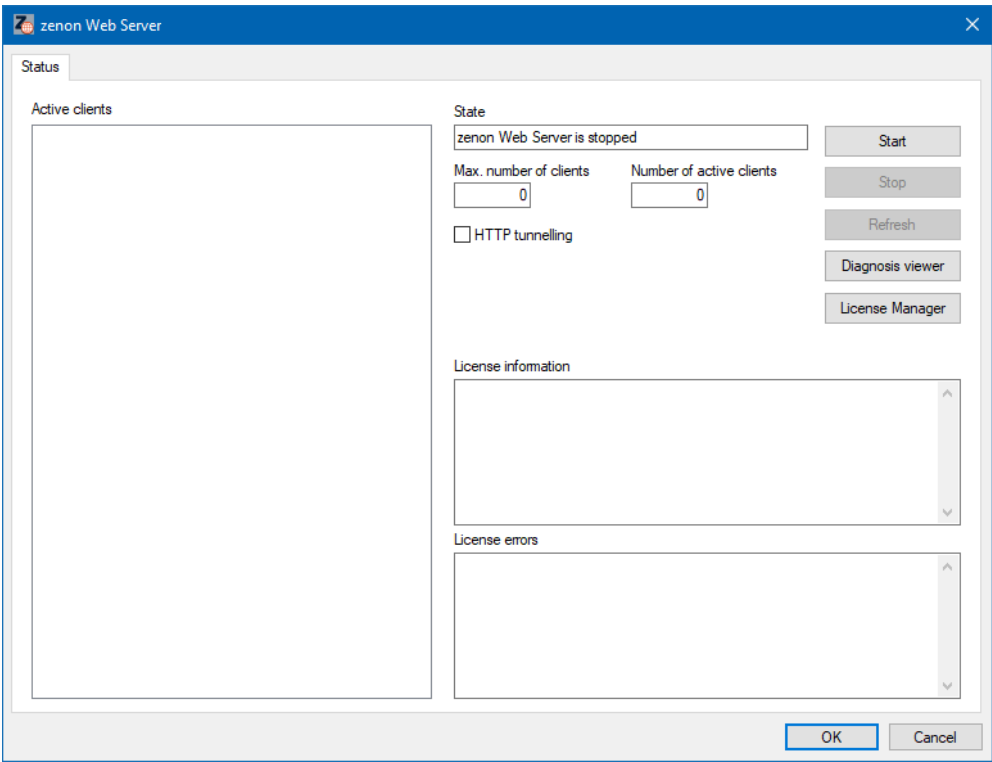
- 3. Select a connection via TCP or HTTP

Attention: Only activate the option for *HTTP tunneling* if you have also explicitly configured all zenon 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 stopped or if you have been assigned a new license via the License Manager, 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.

ZENON WEB SERVER DIALOG



Option	Description
Active Clients	List of the currently-connected zenon web clients.
State:	<div>Displays version and status of the Web Server:</div> <div>Possible versions:</div> <div><ul style="list-style-type: none">▶ zenon Web Server▶ zenon Web Server Pro▶ zenon Web Server Pro Light</div> <div>Possible status messages:</div>

Option	Description
	<ul style="list-style-type: none"> ▶ <i>running</i>: Web Server is running with valid license ▶ <i>stopped</i>: Web Server has been stopped ▶ Demo mode: Web Server is running in demo mode without license ▶ <i>not installed</i>: Web Server not registered as a service or installation error
Max. number of clients:	<p>Maximum number of clients that are permitted to connect to the Web Server. The number is defined by the license. Two clients are licensed for 30 minutes in demo mode.</p> <p>Default: 0</p>
Number of active clients:	Displays the number of clients currently connected.
HTTP tunnelling (on page 40)	<p><i>Active</i>: HTTP tunneling is activated.</p> <p>Not available in the Web Server Pro Light version.</p> <p>Note: Can only be changed if the Web Server has the status <i>stopped</i>. Cannot be switched during operation.</p> <p>Default: <i>Inactive</i></p>
Start	Starts the Web Server
Stop	Stops the Web Server
Refresh	Refreshes the display.
Diagnosis Viewer	Opens the Diagnosis Viewer to evaluate error messages.
License Manager	Opens the License Manager . Licenses can be activated, returned and managed with this tool. The serial number is needed for this.
License information	<p>Shows information about the license currently being used.</p> <ul style="list-style-type: none"> ▶ If used: demo license / education & training license ▶ Licensed product versions ▶ Serial number ▶ Expiry time / duration of use

Option	Description
License errors	Shows information about errors for the licenses found.
OK	Applies settings and closes the dialog.
Cancel	Discards all 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.

3.3.2.1.1 Configuration of the `global_vars.js`

The connection parameters that are required to establish the connection from the zenon 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 = "SwitchToWebClientStart";
```

```
// 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 = "8,0,0,0";
```

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

```
var HTTP = "0";
```

```
// Optional: Set the window style for stand alone start of the web client (not used in embedded mode)
```

```
// possible values:
```

```
// "Default" --> Title with system, min. and max. button
```

```
// "NotClosable" --> Title with min. and max. button
```

```
// "NotResizable" --> Title with system menu
```

```
// "TitleOnly" --> Title without buttons
```

```
// "FullScreen" --> No title (full screen)
```

```
// anything else --> same as "Default"
```

```
var WINDOWSTYLE = "Default";
```

```
//Optional: Folder for the runtime files (NO absolute path; folder. Name will be inserted between "[WEB_PROJECT_PATH]" from zenon6.ini (Default = %temp%\zenWebCli) and project name)
```


//Sample: RuntimeFilesFolderName = "theFolder", ProjectName = "theProject" --> path is
"%TEMP%\zenWebCli\theFolder\theProject"

//Sample: no RuntimeFilesFolderName set, ProjectName = "theProject" --> path is
"%TEMP%\zenWebCli\theProject"

```
var RUNTIMEFILESFOLDER = "";
```

```
function GetStartUrl(){
```

```
    return "ScadaWebClient:Project=" + PROJECTNAME + "&Server=" + RUNTIMESERVER +
    "&Load=-1&ScrollV=0&ScrollH=0&InitFunction=" + INITFUNCTION +
    "&WebServer=" + WEBSERVER + "&Zoom=" + ZOOM + "&UseHTTP=" + HTTP +
    "&Version=" + VERSION + "&WindowState=" + WINDOWSTYLE + "&RuntimeFilesFolder="
    + RUNTIMEFILESFOLDER;
```

```
}
```

PARAMETER

Parameter	Description
PROJECTNAME=	<p>Defines the name of the Runtime project.</p> <pre>var PROJECTNAME = "PROJECTNAME";</pre> <p>Note: The project must run as a server project on the defined Runtime server.</p>
RUNTIMESERVER =	<p>Denotes the target computer on which Runtime for the project runs.</p> <ul style="list-style-type: none"> ▶ Standalone: <pre>var RUNTIMESERVER = "SERVER NAME";</pre> ▶ Network project (on page 29): <pre>var RUNTIMESERVER = "Runtime server; Runtime server2"</pre> <p>Note: Runtime server = Server 1; Runtime server2 = Server 2;</p> <p>The name must correspond with the server name in the project configuration.</p> <p>Note: The IP address must not be used here. There must be naming resolution between the computer with the zenon Web Server and the Primary Server in the network in both directions. A ping to the computer name must work in both directions.</p> <p>You can find further information on the correct configuration of the zenon Web Server when operating a redundant network in the zenon</p>

Parameter	Description
	Web Client in a redundant network (on page 29) chapter.
RuntimeFilesFolder	Subpath. Is inserted between the path and the project name when the project file path is set up. The path is read from the zenon6.ini file or set to %temp%\zenWebCli by default.
WEBSERVER=	<p>Denotes the target computer on which zenon Web Server was installed.</p> <p>Attention: It does not necessarily need to be the publishing server!</p> <p>var WEBSERVER = "WEBSERVER";</p> <p>zenon Web Server redundancy</p> <p>If, in addition to zenon 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"> ▶ two copies of zenon Web Server are installed and licensed on different computers ▶ both copies of zenon Web Server, separated by a comma, are entered in the variable declaration on the HTML page: var WEBSERVER = "WEBSERVER,WEB-STANDBY-SERVER"; <p>Note: Instead of the computer name on which the zenon Web Server is installed, the IP address can also be used here. If the Web Server is behind an NAT router and <i>Port Forwarding</i> is configured, the IP address of the NAT router can also be used here.</p>
INITFUNCTION=	<p>Defines a zenon function that is executed when a project is started in the browser.</p> <p>This setting is optional.</p> <p>var INITFUNCTION = "Init";</p> <p>Note: The wording must correspond to the function names in zenon (capitalization).</p>
ZOOM=	<p>Defines if the project can be zoomed in or out of in the browser view.</p> <p>This setting is optional.</p> <p>var ZOOM = "VALUE";</p> <ul style="list-style-type: none"> ▶ 0: OFF ▶ 1: ON

Parameter	Description
	<p>Default: <i>0: OFF</i></p> <p>For example:</p> <p>var ZOOM = "0";</p> <p>Note: 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>
var VERSION=	<p>Defines the zenon Web Client version.</p> <p>var VERSION = "VALUE";</p> <p>for example:</p> <p>var VERSION = "7,60,0,0";</p> <p>This must always be the same or higher than the version of zenon Runtime.</p>
var HTTP=	<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> <ul style="list-style-type: none"> ▶ 0: inactive ▶ 1: active <p>Default: <i>0: Inactive</i></p> <p>Note: You can find further information in the HTTP tunneling (on page 40) chapter in this manual.</p>

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

3.3.3 zenon Web Client Installation

To install the zenon web client, we recommend:

- ▶ Installation via the zenon web server.
Or:
- ▶ Installation via the setup on the zenon installation medium.

INSTALLATION VIA ZENON WEB SERVER

To install the zenon web client using the zenon web server:

1. Open the zenon web server.
2. Click on the **Installing the zenon Web Client** button.

The **zenon web client** is installed.

Note: Administrator rights are required for this.

Installation can be carried out using two different files. If the **WebClientSmall**-Setup is used, an internet connection is required during installation in order to reload further components.

INSTALLATION FROM THE INSTALLATION MEDIUM

To install the zenon web client from the installation medium:

1. Go to the *WebClient.exe* or *WebClient_small.exe* file on the installation medium.
2. 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.

3.3.3.1 zenon Web Client - compatibility

zenon Runtime is backwards compatible in the network and as a standalone.

That means:

- ▶ The Runtime can always load projects from older version and interpret and display these projects in accordance with their version.
- ▶ Even if Runtime, the server and standby all have a higher version number, they can load projects from older versions and interpret and display this version accordingly.
- ▶ Mixed operation is possible.
With multi-project administration, projects from different versions can be loaded and run at the same time.

Note: Projects from version 6.20 SP4 on can be started directly without being converted first. Projects with a lower version number must be converted beforehand.

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

The Runtime online compatibility makes interoperability of Runtime systems (also via zenon 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
- ▶ 8.10 SP0
- ▶ 7.11 SP0
- ▶ 7.20 SP0
- ▶ 7.20 SP0[latest build no.]
- ▶ 7.50 SP0
- ▶ 7.60 SP0
- ▶ 8.00 SP0
- ▶ 8.10 SP0

Due to the multi-project administration, projects from different versions can be loaded. For example, the integration project can have version 8.00, a subproject version 7.60, and another subproject version 6.51.



Information

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

3.3.3.2 COPA-DATA Web Client Starter

The **zenon Web Client Starter** allows zenon Web Client to be started from any desired browser, via the command line or a link to arguments.

REQUIREMENTS

Requirements for the **zenon Web Client Starter**:

- ▶ Installed **zenon Web Client Starter**: Is also installed during the installation of the zenon Web Client.
- ▶ Any desired browser

START VIA BROWSER

Start from any desired browser:

1. User starts zenon Web Client via a link in the landing page.
2. Operating system finds **zenon Web Client Starter**.
3. Operating system starts **zenon Web Client Starter** and sends link arguments.
4. **zenon Web Client Starter** analyzes link arguments.
5. **zenon Web Client Starter** shows zenon Web Client in accordance with the link arguments

START VIA COMMAND LINE OR A LINK TO ARGUMENTS

The **zenon Web Client Starter** can be started via the command line interface or a link with arguments:

1. The user starts the **zenon Web Client Starter** via the command line or a link to arguments.
2. **zenon Web Client Starter** analyzes arguments.
3. **zenon Web Client Starter** shows zenon Web Client according to the arguments sent.

SYNTAX

Command and syntax:

- ▶ Command: **ZenWebClientStarter.exe**
- ▶ Syntax: **zenWebClientStarter.exe -ArgumentName1 Value1 -ArgumentName2 WValue2 -ArgumentNameNoValue**

Note: Arguments are always case sensitive.

RULES FOR NAMES

The following are not permitted for project name, computer name (Runtime server, web server, Runtime standby, web standby) and name of the init function:

Character	Is used for
Space	Control character for Command Line Interpreter (CLI) syntax.

Character	Is used for
&	Control character for URL syntax.
:	Control character for URL syntax.
=	Control character for URL syntax.
;	Separator between server and standby.

The characters period (.), hyphen (-) and underscore (_) are permitted if they are not at the start of a name.

ARGUMENTS

Argument	Description
RegSrv	<p>Register zenon Web Client Starter for the ScadaWebClient web protocol.</p> <p>Conditions:</p> <ul style="list-style-type: none"> ▶ Must not have a value. ▶ Can only be combined with Silent. ▶ Is only permitted for CLI calls. <p>Only works if the call is made with administrator rights.</p>
UnregSrv	<p>Deregister zenon Web Client Starter for the ScadaWebClient protocol.</p> <p>Conditions:</p> <ul style="list-style-type: none"> ▶ Must not have a value. ▶ Can only be combined with Silent. ▶ Is only permitted for CLI calls. <p>Only works if the call is made with administrator rights.</p>
Project	<p>Name of the project.</p> <p>Is only used to start the zenon Web Client.</p> <p>Attention: Must be stated. With the exception of RegSrv and UnregSrv.</p>
Server	<p>Name of the Runtime server.</p> <p>If a standby server is also used, this is entered separated by a comma: <i>Server;Standby</i></p> <p>Is only used to start the zenon Web Client.</p>

Argument	Description
	Attention: Must be stated. With the exception of RegSrv and UnregSrv .
Load	<p>Is not currently used.</p> <p>Is only used to start the zenon Web Client.</p> <p>32bit Signed Integer</p> <ul style="list-style-type: none"> ▶ 0: <i>FALSE</i> ▶ Other Values: <i>TRUE</i> <p>Default: <i>TRUE</i></p> <p>Entering information is optional.</p>
RuntimeFilesFolder	<p>Subpath. Is inserted between the path and the project name when the project file path is set up. The path is read from the zenon6.ini file or set to %temp%\zenWebCli by default.</p> <p>Is only used to start the zenon Web Client.</p> <p>Entering information is optional.</p>
ScrollV	<p>Position on the vertical scroll bar.</p> <p>Is only used to start the zenon Web Client.</p> <ul style="list-style-type: none"> ▶ Range of values: 0 to 100 <p>Default: 0</p> <p>Entering information is optional.</p>
ScrollH	<p>Position on the horizontal scroll bar.</p> <p>Is only used to start the zenon Web Client.</p> <ul style="list-style-type: none"> ▶ Range of values: 0 to 100 <p>Default: 0</p> <p>Entering information is optional.</p>
InitFunction	<p>Name of function that is to be executed when the zenon Web Client is executed. Is only used to start the zenon Web Client.</p> <p>Default: executes no function</p> <p>Entering information is optional.</p>
WebServer	<p>Name of the zenon Web Server.</p>

Argument	Description
	<p>If a standby server is also used, this is entered separated by a comma: <i>Server;Standby</i></p> <p>Is only used to start the zenon Web Client.</p> <p>Attention: Must be stated. With the exception of RegSrv and UnregSrv.</p>
Zoom	<p>Flag of whether the size of the zenon Web Client is amended to the available space. Is only used to start the zenon Web Client.</p> <p>32bit Signed Integer</p> <ul style="list-style-type: none"> ▶ 0: <i>FALSE</i> ▶ Other Values: <i>TRUE</i> - scrollbars are avoided. <p>Default: <i>FALSE</i></p> <p>Entering information is optional.</p>
UseHTTP	<p>Flag of whether the zenon Web Client uses HTTP tunneling. Is only used to start the zenon Web Client.</p> <p>32bit Signed Integer</p> <ul style="list-style-type: none"> ▶ 0: <i>FALSE</i> ▶ Other Values: <i>TRUE</i> <p>Default: <i>FALSE</i></p> <p>Entering information is optional.</p>
Silent	<p>Switches the zenon Web Client Starter to <i>Silent</i> mode. Must not have a value.</p> <p>For behavior, see the Details on silent mode.</p> <p>Default: <i>nothing Silent</i></p> <p>Entering information is optional.</p>
WindowStyle	<p>Style of the window in which the zenon Web Client is displayed. Is only used to start the zenon Web Client.</p> <p>Corresponds to the possible values of the Runtime title project property in the zenon Editor.</p> <p>Possible values:</p> <ul style="list-style-type: none"> ▶ Default: Corresponds to <i>Title with system, min. and max. button</i>.

Argument	Description
	<ul style="list-style-type: none"> ▶ <i>NotClosable</i>: Corresponds to <i>Title with min. and max. button</i>. ▶ <i>NotResizable</i>: Corresponds to <i>Title with system menu</i>. ▶ <i>TitleOnly</i>: Corresponds to <i>Title without buttons</i>. ▶ <i>FullScreen</i>: Corresponds to <i>No title</i> (complete screen). <p>Entering information is optional.</p>
Version	<p>Minimum version for zenon Web Client Starter.</p> <p>Is only used to start the zenon Web Client.</p> <p>If the version is lower than the one set here, an error message is shown.</p> <ul style="list-style-type: none"> ▶ Syntax for values: <i>[32-bit unsigned int].[32-bit unsigned int].[32-bit unsigned int].[32-bit unsigned int]</i> Instead of a period (.), a comma (,) can also be used. <p>Default: no version check</p> <p>Entering information is optional.</p>

DETAILS ON SILENT MODE

Behavior when starting in the mode:

- ▶ *Not Silent*:
 - ▶ Errors are shown in the message window.
 - ▶ Success medium for registering/deregistering is shown in the message window.
- ▶ *Silent*:
 - ▶ No message window is displayed.
 - ▶ All errors and success messages are output via **STDOUT**.
 - ▶ **STDOUT** Can be diverted into a file.
Operators:
 - >: Divert output and overwrite file.
 - >>: Divert output and attach existing file.

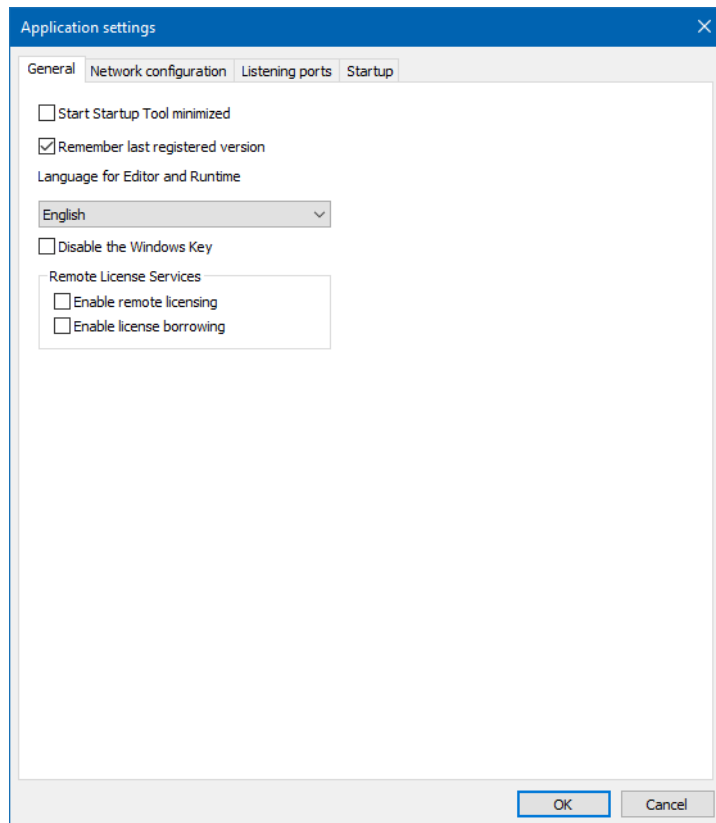
EXAMPLES

Examples for starting via the command line:

„ScadaWebClient:Project=THE_PROJECT&Server=RuntimeServer.Domain&WebServer=WebServer.Domain&ScrollV=50&ScrollH=50“

3.3.3.3 Language setting of zenon Web Client

To configure the language for the Web Client:



1. Start **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.

3.3.3.4 zenon Web Client in the redundant network

In the event of a redundant zenon network configuration, the issuing of roles for the primary server and the standby server depends on the **Redundancy mode** set. In doing so, the role of the configured **Server 1** and **Server 2** computers can change over time in the Runtime, depending on the configuration of the **Redundancy mode** and the current evaluation (for **Redundancy mode evaluated**).

You should therefore configure both servers for the zenon Web Server. To do this, in the *global_vars.js* configuration file, change the line with the entry **RUNTIMESERVER=** and enter both computers there.

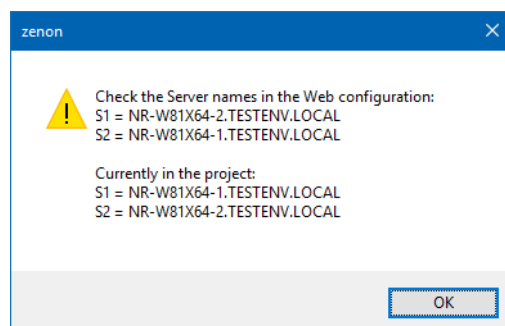
In doing so, the sequence should conform to the configuration in the zenon Editor.

You can find details on configuration in the configuration of *global_vars.js* (on page 15) chapter.

AMENDED SERVER CONFIGURATION

If the server names configured in the Editor do not correspond to the server names of *global_vars.js*, the zenon Web Client 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 zenon Web Client must be restarted.



Attention

If the project configuration of **Server 1** and **Server 2** is changed 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 4) manual in the configuration of *global_vars.js* (on page 15) chapter.

3.3.3.5 Creation of the HTML page for the project entry

A project start page (on page 31) 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 30), to a start page (*index.htm*) (on page 31), that allows the download of the zenon 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.

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

On the project entry page (on page 31), a browser check verifies which browser the zenon Web Client uses. Depending on the result, the zenon Web Client is started or an error message is given.

Example of project start:

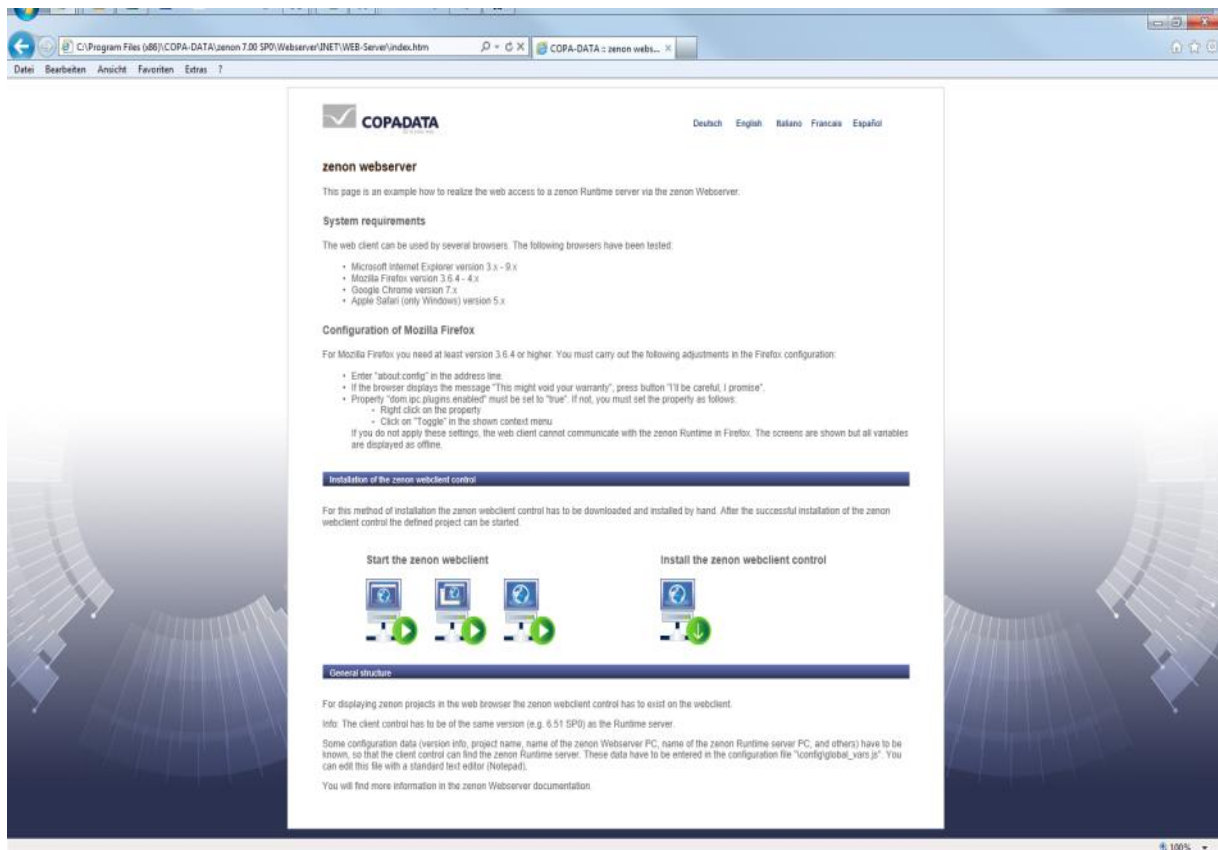
The start page (on page 31) calls up three scripts in order to check the browser used and either to establish a connection to Runtime or to issue an error message:

- ▶ *global_vars.js* (on page 15): Defines values of transfer parameters to start the zenon Web Client
- ▶ *browsercheck.js* (on page 32): Checks the version of the browser
- ▶ *initcode.js* (on page 33): Defines functions that are used to start the zenon Web Client

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

3.3.3.6 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 zenon Web Client.
- ▶ Calls up the project entry page **init.htm (on page 30)** when the zenon Web Client is started, which carries out the browser check.

3.3.3.7 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 32).
3. If it is a supported browser, the appropriate function to include the zenon Web Client from **initcode.js** (on page 33) 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>
```

3.3.3.8 browsercheck.js

This JavaScript finds out which browser the zenon Web Client wants to start and gives the result back to **init.htm** (on page 31).


```
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('Trident') != -1); // search for rendering engine

if(fWin32)
{
//Win32-Browser
if(fMSIE)
{
//Internet Explorer --> use ActiveX-Control
return "IEXPLORER";
}
}
//Non-Win32-Browser or not supported Browser (Opera, ...)
return "UNSUPPORTED_BROWSER";
}
```

3.3.3.9initcode.js

This JavaScript requires the [<object>](#) entry to start the zenon web client.

Script:

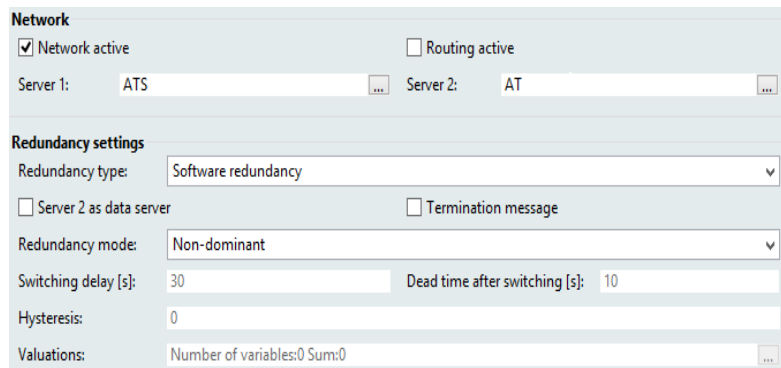
```
function runIexplorer(PROJECTNAME,RUNTIMESERVER,WEBSERVER,INITFUNCTION,ZOOM,VERSION,HTTP) {
document.write ('<object');
document.write (' id="CD_IClient1"');
document.write (' classid="clsid:2A3BC66B-03D7-11D4-991A-080009ABB492"');
document.write (' codebase="npzenWebCli.dll#version=' +VERSION+ '");
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 (' <PARAM NAME="RuntimeFilesFolder" VALUE="" +RUNTIMEFILESFOLDER+ ">');
document.write ('</object>');
}
```

3.4 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 in 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 30) 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.

3.4.1 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 for 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 zenon 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.

▶ Process Recorder:

Replay is not available.

▶ Project simulation:

Project simulation is not supported.

▶ **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: Message boxes of VBA macros are not shown in the zenon Web Client if Internet Explorer is used as a web browser.

▶ 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 44) chapters.

- ▶ It is not possible to start and stop a zenon Logic Runtime in a project that is operated from 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.

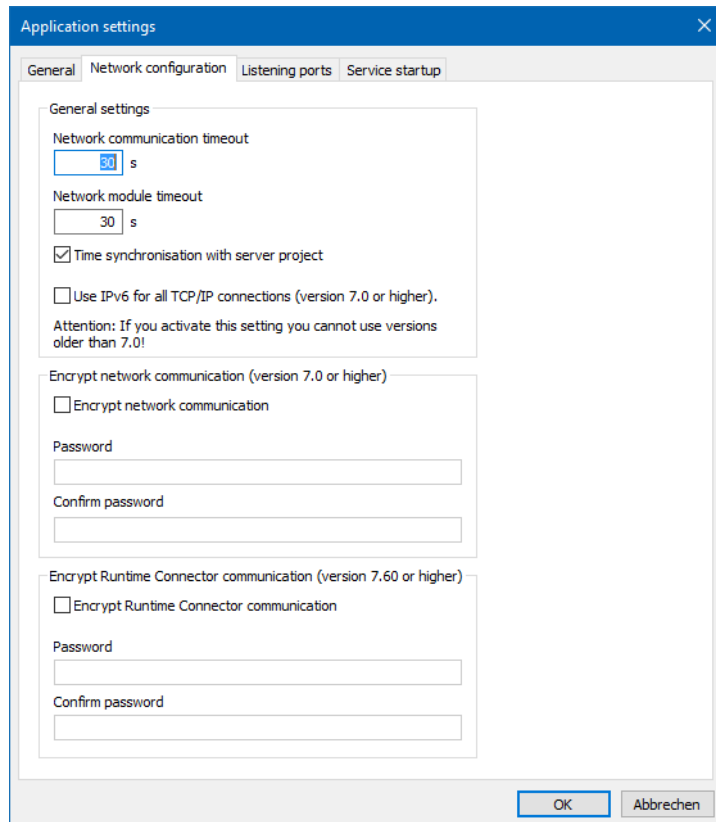
3.4.2 Encryption of the communication in the network.

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 menu entry **Options...**
3. Switch to the tab **Network configuration**

4. Activate the **Encrypt network communication** checkbox to activate encrypted zenon 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.

3.5 IPv6

As of zenon version 7.00 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.

3.6 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 CD_PRODUCTNAME Web Server.



Attention

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

- ▶ zenon Web Client is restarted or
- ▶ The Standby zenon 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 zenon Web Server to the Primary Server is always made via TCP. A separate HTTP connection is created for each connection from the zenon Web Client to the zenon 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** must be reachable on the computer of the zenon Web Server.
- ▶ The **UseHTTP** parameter of the project entry page for zenon Web Clients which are to be connected to the zenon Web Server via HTTP tunneling must have a value that is not 0 in the *<embed>* and *<object>* entries.

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. Go to the **NET_PROXYPORT=** entry or create this.

3. Configure the desired port

Default: 8080

The zenon Web Server listens on the port, and the zenon Web Client connects to this 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 zenon 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 zenon 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 zenon Web Server in the Windows Firewall, as an exceptional port for incoming connections.

PROCEDURE:

The zenon Web Client sends its messages for the Runtime server to the zenon 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 zenon Web Client via TCP to the zenon Web Server, which buffers them.

The buffer of a connection is emptied by the zenon Web Client via a 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 set default of 2 seconds).

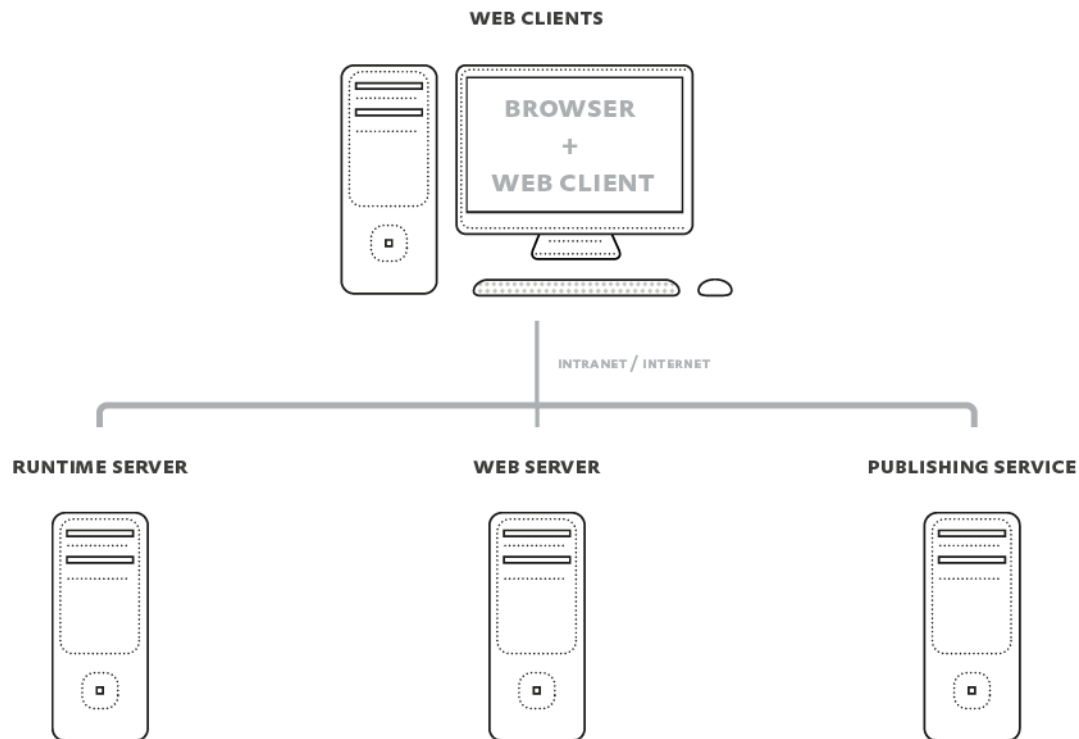
For details, see the Procedure for HTTP connection (on page 42) chapter.

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 zenon 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 31).
2. The project entry page induces the browser to start the zenon Web Client with the pre-defined HTTP tunneling configuration.
3. The zenon Web Client makes 3 HTTP connections (control, data and file synchronization connection) to the zenon Web Server:
 - a) A connection ID is requested by the zenon Web Client.
 - b) The zenon 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 zenon Web Server via the HTTP connection.
 - d) The zenon Web Server checks to evaluate if this zenon 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 zenon Web Server works as a protocol translator between TCP and HTTP and buffers the messages.
 - b) Data from Runtime for the zenon Web Client is buffered on the server. The zenon Web Client calls this up by means of GET requests.
 - c) Data from the zenon Web Client for Runtime is sent from the zenon Web Client by means of a POST request and forwarded to Runtime by the zenon Web Server.
5. If the zenon Web Client is ended in the browser (the browser is closed or the project entry page is left), all connections are disconnected by the zenon Web Client.
 - a) The zenon Web Client sends a network-end package to the zenon Web Server. The zenon Web Server forwards this to the Runtime, ends the connection and clears the occupied resources (working memory, ports, connection ID ...).
 - b) When the client is cleaning up, an additional HTTP end packet is sent to the zenon Web Server, to ensure that the connection ID was removed from the list.

3.8 Supported web browsers:

The zenon web client can use any desired browser with the **COPA-DATA Web Client Starter** (on page 21).

Attention: The 64-bit version of Internet Explorer 11 does not support ActiveX and therefore cannot be used as a zenon **Web Client**.

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. Go 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 5).

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

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 8.10.

- ▶ **VSTAIntegration.dll** must be in the zenon program folder.
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]

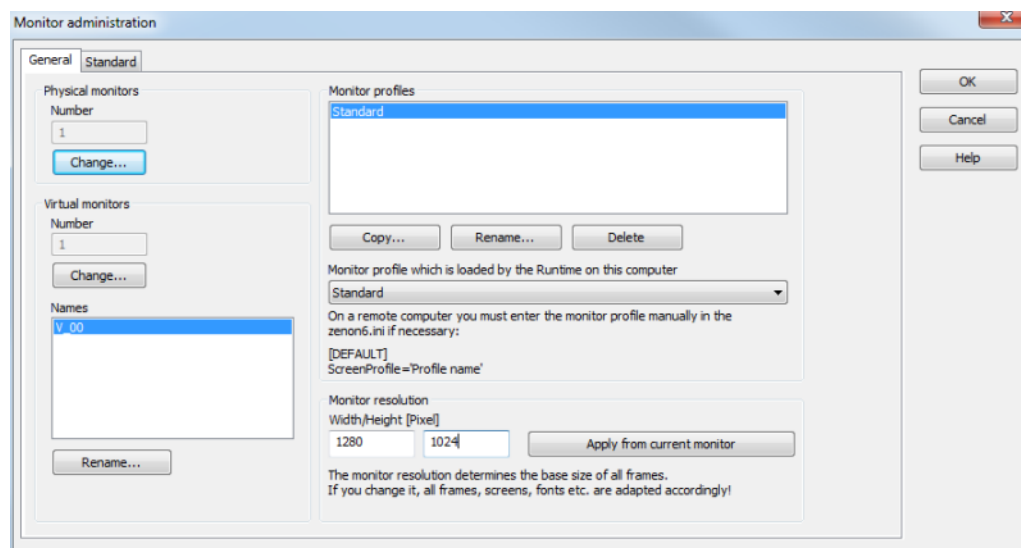
EIN=1

EVENT=1

3.11 Monitor resolution and monitor management

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 monitor 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!

MULTIPLE MONITOR SYSTEM

On a multi-monitor system, the process screens are opened as defined in the profile, on different real monitors. When using a zenon 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 zenon Web Server - Implementaiton in the internet environment

Note: If the zenon Web Client is to contact the zenon Web Server via the Internet, it is recommended that a VPN connection is set up between the network with the zenon Web Client computer, the network with the zenon Web Server computer, and the zenon 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) :
 - ▶ For Web Server **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 treatment

Known error messages or execution errors:

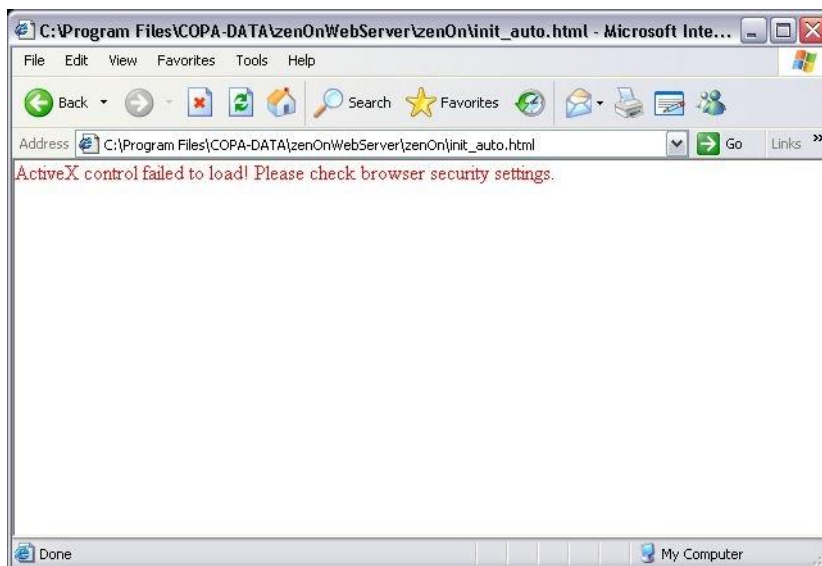
- ▶ Crash after browser refresh (on page 47)
- ▶ ActiveX control failed to load (on page 48)
- ▶ ActiveX control not installed correctly (on page 49)
- ▶ Exceptional Web Client error in Internet Explorer 8 (on page 49)
- ▶ HTTP error messages (on page 50)
- ▶ Init Runtime Error (on page 54)
- ▶ Keyboards in Firefox (on page 54)
- ▶ Max. clients (on page 55)

3.13.1 Error 101

If a zenon Web Client has already been installed on the Client computer, this may result in an error when connecting from the zenon Web Client to the zenon Web Server or Runtime Server.

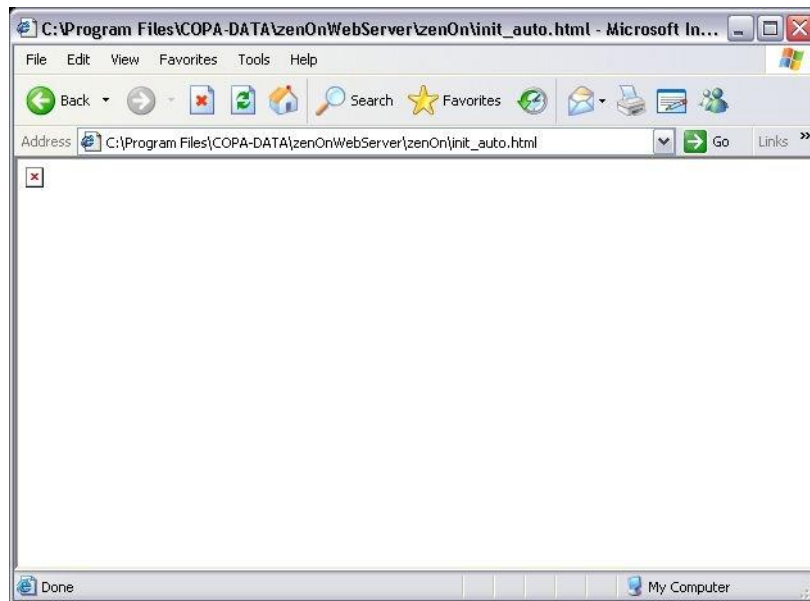
- ▶ Error message:
Error 101
Project XXX has been edited with version XXX and cannot be opened here
- ▶ Solution:
 - a) Uninstall all zenon Web Clients.
 - b) Restart the computer
 - c) Reinstall the zenon Web Client

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 cause: 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 calling up the project start page, then

- ▶ the **ActiveX Control** for the zenon Web Client has not been installed correctly and/or
- ▶ The wrong version (on page 20) of zenon Web Client is installed

3.13.4 Exceptional zenon Web Client error in Internet Explorer 8 or higher

ERROR

The zenon 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
NetSrv Error Do Send HTTP failed! HTTP-Status: [HTTP-Status]	<i>ERRORS</i>	The HTTP Web Server has responded to an HTTP POST request with an error.
NetSrv Error Do Send HTTP failed!	<i>ERRORS</i>	The HTTP POST request failed (e.g. timeout).
NetSrv Error Do Send HTTP Server failed! Data Management Class Error!	<i>ERRORS</i>	An error occurred when saving a message in the buffer to the HTTP Web Server. The error occurred in the data management class.
NetSrv Error Do Send HTTP Server failed!	<i>ERRORS</i>	An error occurred when saving a message in the buffer to the HTTP Web Server. The error occurred in the buffer list.
NetSrv Error Do Recv HTTP failed! HTTP-Status: [HTTP-Status]	<i>ERRORS</i>	The HTTP Web Server has responded to an HTTP GET request with an error.
NetSrv Error Do Recv HTTP failed!	<i>ERRORS</i>	The HTTP Get request failed (e.g. timeout).
NetSrv Error Do Recv HTTP Server failed! Data Management Class Error!	<i>ERRORS</i>	An error occurred when reading a message in the buffer to the HTTP Web Server. The error occurred in the data management class.
NetSrv Error Do Recv HTTP Server failed! Buffer Too Small!	<i>ERRORS</i>	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.
NetSrv Error Do Recv HTTP Server failed! Error While Copying Data Into Buffer!	<i>ERRORS</i>	An error occurred when copying data from the buffer list.
Error Out Of Memory While Adding Data to HTTP GET Response	<i>ERRORS</i>	Creation of a memory area was not possible when compiling an HTTP response at the HTTP Web Server.
Error On Adding Data to HTTP GET Response	<i>ERRORS</i>	An error occurred when copying data from the buffer list in the HTTP response.
HTTP Send Get Response	<i>ERRORS</i>	Sending of a response to an HTTP GET request has

Entry	Level	Description
Failed: [Status]		failed. The status code is a system error code (can be looked up in the MSDN library).
Error Out Of Memory While Receiving Data from HTTP POST	<i>ERRORS</i>	Creation of a memory area was not possible when reading off an HTTP POST response at the HTTP Web Server.
Error on Receiving Data from HTTP POST [Status]	<i>ERRORS</i>	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).
Error Data Block Of HTTP Post Request Too Large	<i>ERRORS</i>	The data from the request received exceeds the defined maximum packet size.
HTTP Send Post Response Failed: [Status]	<i>ERRORS</i>	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).
Error Out Of Memory While Parsing HTTP Request	<i>ERRORS</i>	Creation of a memory area was not possible when forwarding an HTTP response to the relevant thread.
Memory Error on Creating Receive Buffer	<i>ERRORS</i>	Creation of a memory area when creating the HTTP receipt buffer was not possible.
Error on Creating HTTP Request Event	<i>ERRORS</i>	Creation of events for the receipt of HTTP requests has failed.
Error While Waiting For HTTP Request: [Status] --> Exiting Listening Thread	<i>ERRORS</i>	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).
Unexpected Result While Waiting For HTTP Request: [Status] --> Exiting Listening Thread	<i>ERRORS</i>	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).
HTTP-Request Without ID Received	<i>ERRORS</i>	The connection ID was not present in the HTTP request.
Error on Extracting HTTP-Request-ID From URL	<i>ERRORS</i>	The connection ID of the HTTP request cannot be read off.
Error: Closing HTTP Connection ID [ID] Could Not Be Resolved	<i>ERRORS</i>	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.

Entry	Level	Description
HTTP-Request With Incompatible ID Format Received	<i>ERRORS</i>	The connection ID in the HTTP request does not have the expected format.
Could Not Assign New HTTP ID Because The Map Is Full	<i>ERRORS</i>	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.
Error During HTTP-Accept	<i>ERRORS</i>	An error occurred when accepting the HTTP connection.
Error On Sending HTTP ID: [Status]	<i>ERRORS</i>	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).
Error: HTTP Connection ID [ID] Could Not Be Resolved	<i>ERRORS</i>	The connection ID of the HTTP request cannot be resolved.
Error: HTTP Request Could Not Be Assigned To The Socket	<i>ERRORS</i>	The HTTP request could not be forwarded to the relevant thread.
Unsupported HTTP-Request Received	<i>ERRORS</i>	An unsupported HTTP request was received. GET and POST requests are supported.
Error While Receiving HTTP Request: [Status] --> Exiting Listening Thread	<i>ERRORS</i>	An error occurred when receiving an HTTP request.
Error on Removing HTTP Connection ID From The Map!	<i>ERRORS</i>	An error occurred when removing a connection ID from the list. Connection IDs are removed if a connection is closed.
Removing HTTP Connection ID [ID] From The Map!	<i>DEBUG</i>	The connection was closed and the ID was removed from the list.
Error on Removing Non-Active HTTP Connection ID From The Map!	<i>ERRORS</i>	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.
Removing Non-Active HTTP Connection ID [ID] From The Map!	<i>DEBUG</i>	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

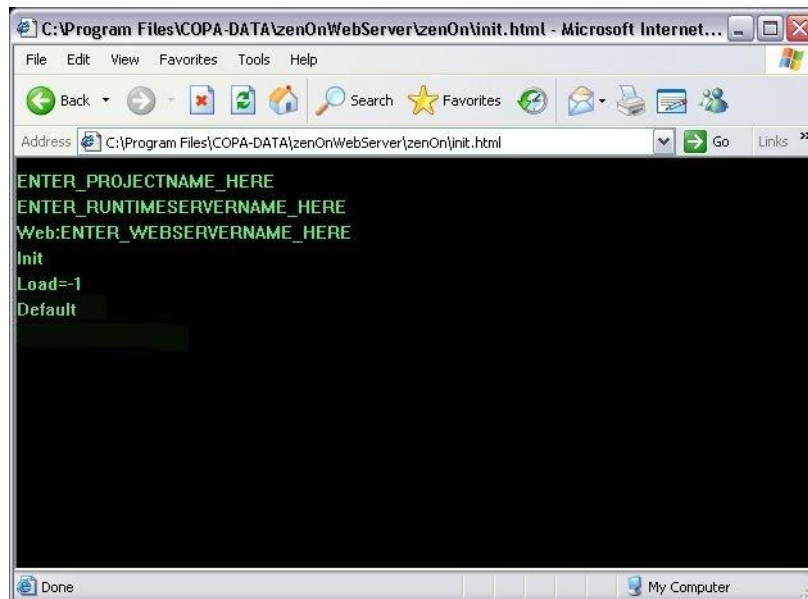
Entry	Level	Description
		due to the lack of a watchdog.
Error While Waiting for HTTP Connection Map Check [Status]!	<i>ERRORS</i>	The thread to check the connection ID established an error when waiting for the next cycle and is ended. The status code is a system error code (can be looked up in the MSDN library).
NetSrv Accept HTTP Client Socket Error On Starting HTTP Reply Thread	<i>ERRORS</i>	The thread to respond to HTTP requests could not be started.
NetSrv Info Accept HTTP Client IP:[IP-Adressr]:[Port] Ok	<i>DEBUG</i>	The HTTP connection has been accepted successfully.
NetSrv Memory Error Do Recv HTTP failed!	<i>ERRORS</i>	An error has occurred because too little memory is available when receiving data via HTTP tunneling.

LOG ENTRIES FROM CNSBLOCKINGSOCKETEXCEPTIONS

LOG entries and short description:

Entry (exception text)	Level	Description
Connect: HTTP Error	<i>ERRORS</i>	The HTTP Web Server has responded to a connection ID request with an error.
Connect: ID-Data did not have the expected Format	<i>ERRORS</i>	The connection ID provided by the HTTP Web Server does not have the expected format.
Connect: Server denied HTTP ID	<i>ERRORS</i>	The HTTP Web Server has rejected the granting of a connection ID.
Connect: Error during ID-Acquisition	<i>ERRORS</i>	An error occurred when requesting a connection ID (e.g. timeout).
HttpInitialize Failed	<i>ERRORS</i>	HTTP server API could not be initialized
HttpCreateHttpHandle Failed	<i>ERRORS</i>	The HTTP request list could not be created
HttpAddUrl Failed	<i>ERRORS</i>	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 zenon 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 after losing focus** frame option. Correct display in Mozilla Firefox is possible as a result.

Automatic keyboards are not affected!

3.13.8 Max. clients



Message to the zenon Web Client.

More clients than are licensed (on page 6) are attempting to connect to the zenon Web Server.

3.13.9 Behavior of the zenon 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 Standby Server takes on its role.
- ▶ The Primary Server comes back and resumes its role again (= the Standby Server quits the connection).
- ▶ The zenon 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. zenon Web Server and Primary Server

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

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

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

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