



**COPADATA**  
do it your way

# zenon manual

## HTML Web Engine

v.8.00





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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. 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](mailto:documentation@copadata.com).

## **PROJECT SUPPORT**

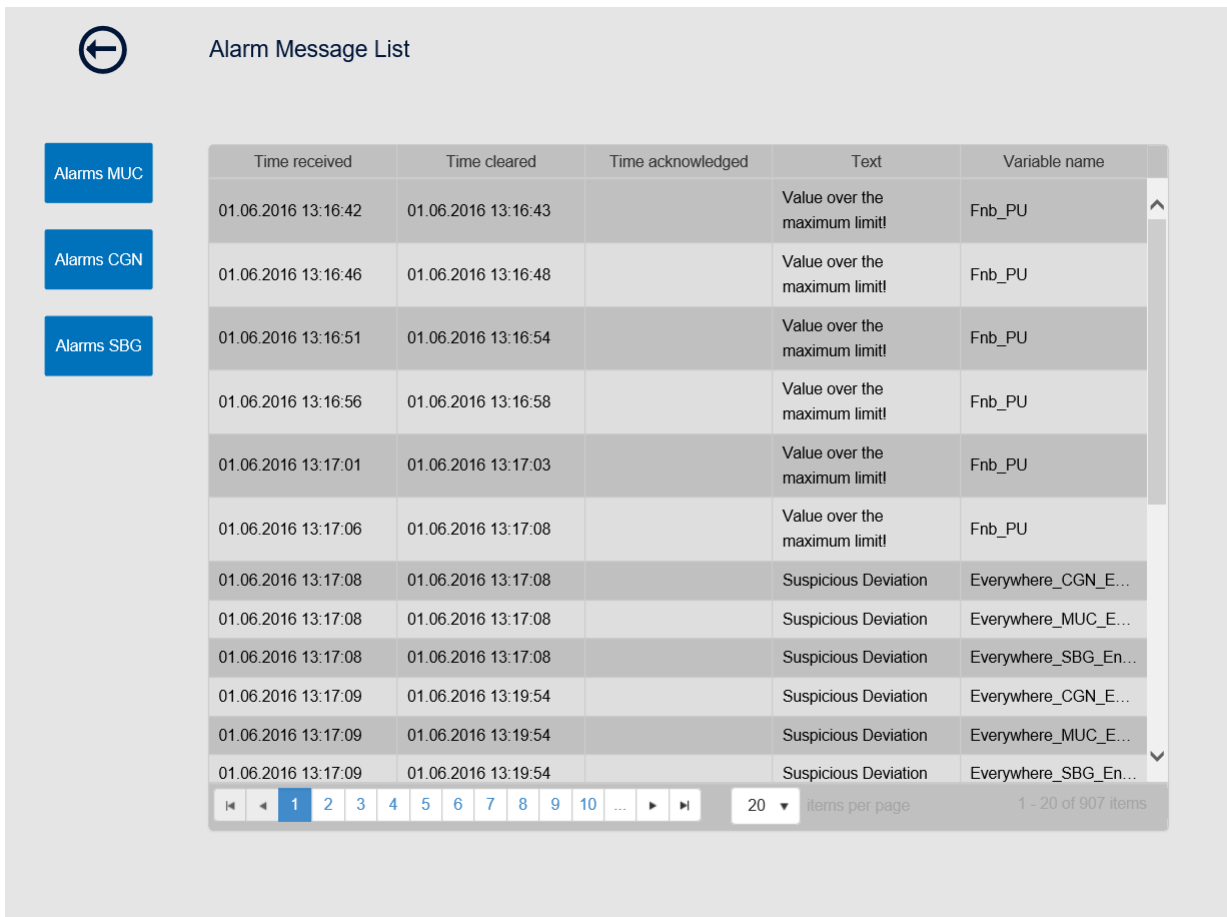
You can receive support for any real project you may have from our Support Team, who you can contact via email at [support@copadata.com](mailto:support@copadata.com).

## **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).

## 2. 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 any browser plug-ins - are required on the end device. Process data for the visualization is taken from zenon Runtime.



Alarm Message List

Time received	Time cleared	Time acknowledged	Text	Variable name
01.06.2016 13:16:42	01.06.2016 13:16:43		Value over the maximum limit!	Fnb_PU
01.06.2016 13:16:46	01.06.2016 13:16:48		Value over the maximum limit!	Fnb_PU
01.06.2016 13:16:51	01.06.2016 13:16:54		Value over the maximum limit!	Fnb_PU
01.06.2016 13:16:56	01.06.2016 13:16:58		Value over the maximum limit!	Fnb_PU
01.06.2016 13:17:01	01.06.2016 13:17:03		Value over the maximum limit!	Fnb_PU
01.06.2016 13:17:06	01.06.2016 13:17:08		Value over the maximum limit!	Fnb_PU
01.06.2016 13:17:08	01.06.2016 13:17:08		Suspicious Deviation	Everywhere_CGN_E...
01.06.2016 13:17:08	01.06.2016 13:17:08		Suspicious Deviation	Everywhere_MUC_E...
01.06.2016 13:17:08	01.06.2016 13:17:08		Suspicious Deviation	Everywhere_SBG_En...
01.06.2016 13:17:09	01.06.2016 13:19:54		Suspicious Deviation	Everywhere_CGN_E...
01.06.2016 13:17:09	01.06.2016 13:19:54		Suspicious Deviation	Everywhere_MUC_E...
01.06.2016 13:17:09	01.06.2016 13:19:54		Suspicious Deviation	Everywhere_SBG_En...

1 2 3 4 5 6 7 8 9 10 ... 20 items per page 1 - 20 of 907 items

### FUNCTIONALITIES OF THE HTML WEB ENGINE

Overview of the functions of the HTML web engine:

- ▶ Session-based provision of HTML5 visualization content on HTML web clients.
- ▶ Display of basic visualization content that was created in the zenon Editor.
- ▶ Data view:
  - Variable values  
Displays are updated dynamically in the HTML Web Engine.

- Chronological Event List (CEL)  
Entries in the CEL are updated dynamically in the HTML Web Engine.
  - Extended Trend (ETM)  
The display in the ETM is not updated dynamically in the HTML Web Engine. This means that the ETM only draws with existing data when called up and is then no longer updated.
  - Messages from the Alarm Message List (AML)  
Entries in the AML are updated dynamically in the HTML Web Engine.
- ▶ 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 the authentication of a Web Engine client with increased security in relation to the zenon user authentication and Active Directory. Login is via entry of the user name and password.

## REGIONAL SETTINGS

The HTML Web Engine supports most common languages, settings, number formats and date formats.

### 3. 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 6)	<p>The HTML Web Engine is for the provision of process screens as an HTML5 web page. The user interface is called up and displayed on the visualization end device using a web browser. Neither special software installation nor a software plug-in are required on the end device. Process data for the visualization is taken from zenon Runtime.</p> <p><b>Note:</b> 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 (on page 14)publishing service</b>	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. <b>Deployment</b> (on page 23) is used to instance the HTML Web Engine on the IIS.
<b>Web browser</b>	Web browsers are special computer programs for the display of documents and data, especially web sites in the World Wide Web.
<b>zenon Web Engine Deployment Tool</b> (on page 23)	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 updated or deleted.
<b>Web engine compiler</b>	Generates, from a zenon project, the data that the HTML Web Engine needs to provide HTML5 content for the zenon 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 21)	Serves as a communication interface to zenon Runtime.



	<p>You can find the <b>SCADA Runtime Connector</b> in the following path:</p> <pre>%programfiles(x86)%\Common Files\COPA-DATA\Connectors\zrsConnector.exe</pre> <p>If the web deployment tool is used, the <b>SCADA Runtime connector</b> must be executed, because its status is checked when used.</p> <p>The Connector Container can be started automatically using the <b>Startup Tool</b> if a user logs on to the system.</p>
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## 4. Basic system construction of the HTML Web Engine

The HTML Web Engine is a web application that provides an HTML5 web page.



### Attention

#### Recommendations:

- ▶ Always operate the whole system configuration in a trusted network area.
- ▶ Never publish the HTML5 web site in the Internet directly.

In the course of a session, a distinction between two different connection levels is made:

1. Display of visualization pages without process data
2. Display of the visualization pages and display of process data

### DISPLAY OF VISUALIZATION PAGES WITHOUT PROCESS DATA

The zenon Web Client connects itself 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.

### DISPLAY OF THE VISUALIZATION PAGES AND DISPLAY OF PROCESS DATA

The HTML Web Engine connects itself to zenon Runtime via the SCADA 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

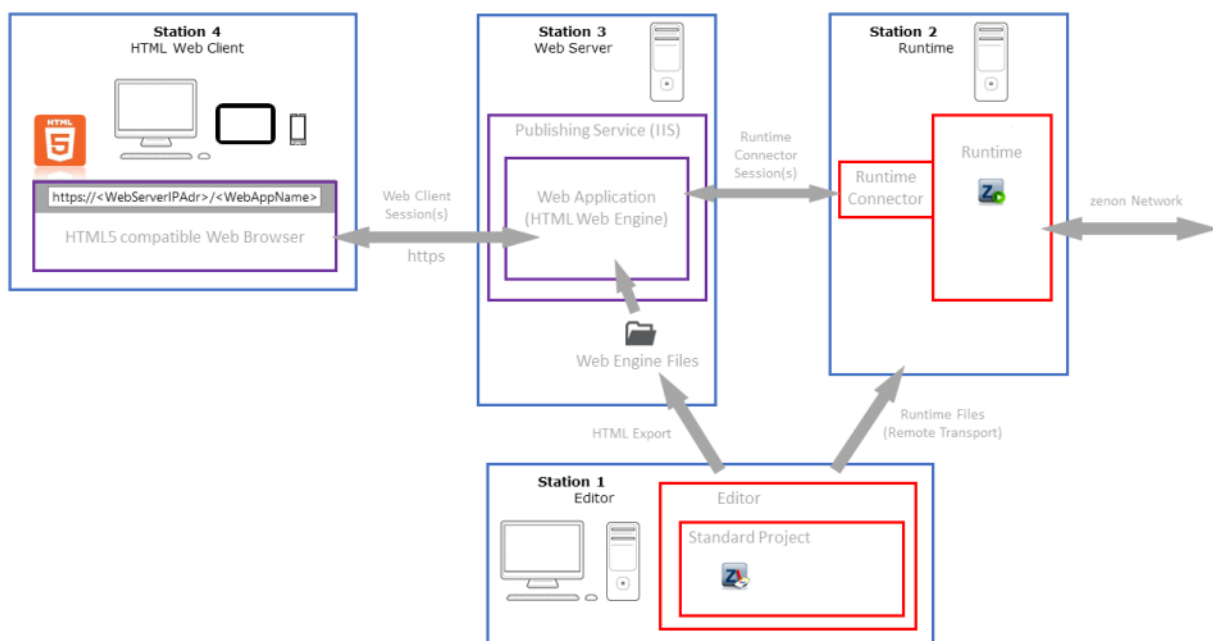
administration of zenon Runtime. The transfer of user information can be either manual by the zenon Web Client operator or automatic by the Web Engine.

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 33) chapter.

### ACCESS TO HTML5 VISUALIZATION FROM AN END DEVICE

This is how you use an HTML5-compatible web browser to access the HTML5 visualization from a visualization end device:



**Note:** The breakdown of the components 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.

#### Procedure:

1. 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, it gets the visualization pages there from the Web Engine.
2. Process data is only displayed in the HTML5 visualization after successful user authorization. After a check of the user name and password has been carried out, the connection to zenon Runtime is established (to Station 2 in the example).

3. The interface between zenon Runtime and Web Engine is formed by the **SCADA Runtime Connector**.

The SCADA Runtime Connector must be started on the computer the zenon Runtime is running.

4. The configuration of the HTML5 visualization is derived from a zenon Editor project (on Station 1 in this case).

The project states on Station 2 (zenon Runtime) and Station 3 (Web Engine) should be identical for this.

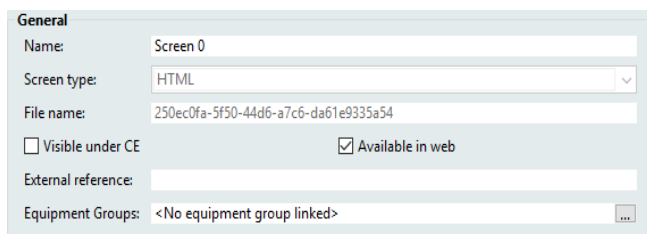
With the **Web Engine Compiler**, the project data is translated for use by the HTML Web Engine. The necessary steps for the installation of the HTML Web Engine on Station 3 and the deployment on the Internet Information Server are described in the Deployment of the web engine (on page 23) chapter.

The file from the **Web Engine Compiler** is saved in a freely-definable folder. It is read by the HTML Web Engine from here.

**Note:** Provide, for the connection of HTML5 visualization, a dedicated zenon Runtime, in order to guarantee smooth interaction for process-related procedures. After changes are made in the zenon project, carry out the compiling process again.

## RELEASE SCREENS

Certain screens from the active project can be called up in a web browser by means of the HTML Web Engine. You determine the screens that are unlocked for display in the web browser for each screen using the **Available in web** property.



All screens for which this property has been activated are compiled with the **Web Engine Compiler** for the Web Engine and are primarily available for provision in the web browser on the client. 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:

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

## 5. 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 and Enterprise, both x86 and x64 versions.
<b>Windows 10</b>	Pro, Enterprise and Education, both x86 And x64 versions.
<b>Windows Server 2008 R2 (SP1)</b>	All editions with the exception of the Core Edition.
<b>Windows Server 2012 and 2012 R2</b>	All editions with the exception of the Core Edition.

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

### WEB CLIENT

No special installation is required for the HTML Web Client. It generally works with any web browser that supports the following technologies:

- ▶ HTML5
- ▶ HTML5 Canvas
- ▶ JavaScript (ECMAScript 5.1)

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 from version 11
- ▶ Microsoft Edge
- ▶ Mozilla Firefox
- ▶ Apple Safari
- ▶ Google Chrome

**Note:** JavaScript must be activated in the web browser.

## 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, corresponding messages are 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.

**Note:** When using Windows Server operating systems, the number of simultaneous client connections is not limited by the Microsoft IIS. When using Windows desktop operating systems, the possible number of simultaneous connections depend on the version the installed operating system.

## 6. Licensing

The HTML Web Engine must be licensed for each instance. **Licensing** is carried out using the **COPA-DATA License Administration**. If there is no license, the HTML Web Engine is started in a time-limited demo mode.

The following expansions are available for the HTML web engine:

- ▶ **Standard:** Only read access to the visualization. The **HTML Web Client** can be used as an observer.
- ▶ **Pro:** Full access to the visualization, read and write.



### Information

Note the limitation of the number of simultaneous client connections by the Microsoft IIS.

**Note:** When using Windows Server operating systems, the number of simultaneous client connections is not limited by the Microsoft IIS. When using Windows desktop operating systems, this number varies depending on the version of the installed operating system.

### Differences between the HTML web engine and zenon Web Server:

- ▶ The license check is carried out on the basis of instances. Each project corresponds to an instance.
- ▶ If a license is invalid, a further license is first searched for. If none is found, a further license can be searched for using the license search button.
- ▶ If demo licenses expire, the service must be restarted in order to be able to use the demo mode. The demo mode is only available if a demo license has been saved.

## 7. Installation

You need the following installations to operate the HTML Web Engine:

### Web Server:

- ▶ IIS publishing service:  
Set up the publishing service in accordance with the instructions in the Install IIS publishing service (on page 14) chapter.
- ▶ zenon Web Server.  
Install zenon Web Server from the installation medium.  
Microsoft Web Deploy It also automatically installed during setup.

### Project configuration and runtime application:

- ▶ zenon (Editor and Runtime).

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

### 7.1 IIS Publishing service installation

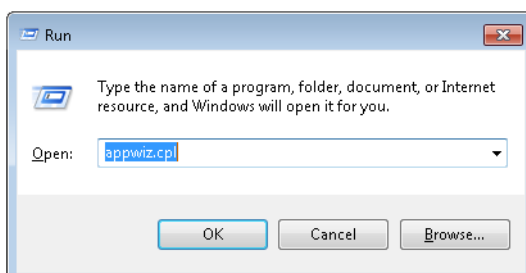
Internet information Services, abbreviated to IIS, are for the publication of documents, such as HTML pages, using the HTTP protocol. For the operating systems listed in the System requirements (on page 12) chapter, the IIS publishing service is already included in the standard installation. This need only be activated by means of the Windows features.

#### IIS 7, WINDOWS 7

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.



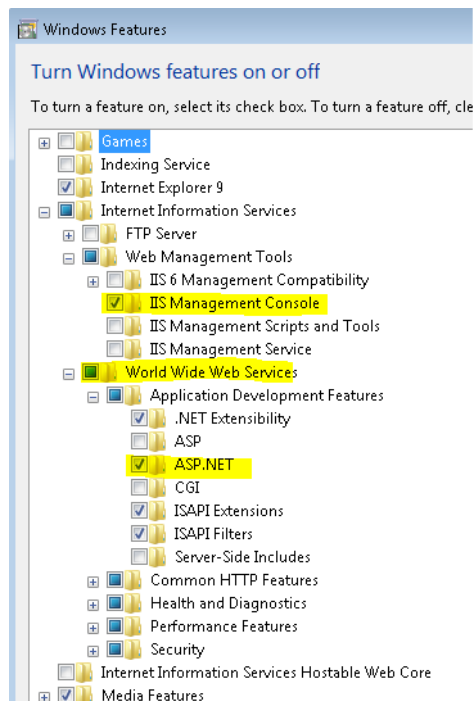
2. Enter `appwiz.cpl` in the input field.

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** in this node.
5. Activate `WWW services`.  
The default settings are thus set in all subfolders of the property.
6. Expand the **Application development features** node.
7. Activate the **ASP.NET** option:
8. Expand the **Web administration tools** node.
9. There, activate the **IIS administration console**.
10. Click on **OK**.

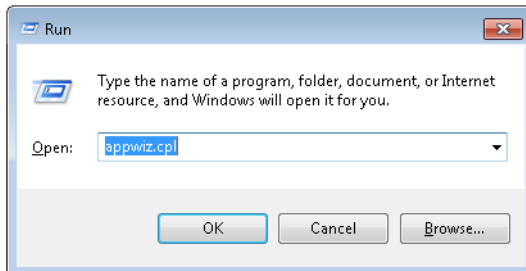
**Note:** In the event of subsequent installation or upgrading of the NET framework under Windows 7, this software must be registered manually in the IIS publishing service. For more details, see the chapter **.NET registration on IIS for Windows 7** (on page 20).

## IIS 8, WINDOWS 8/8.1

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.



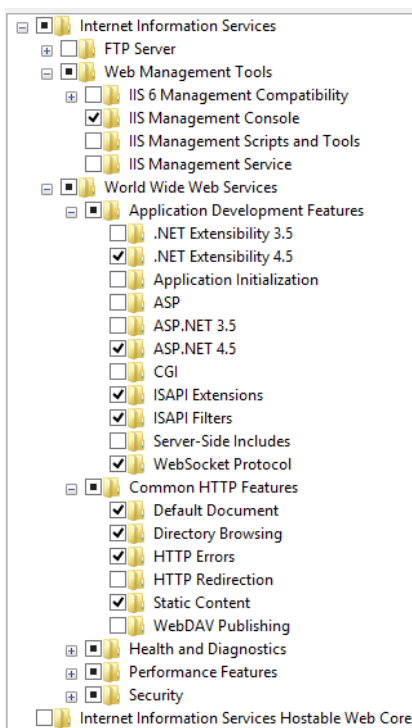
2. Enter `appwiz.cpl` in the input field.

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** in this node.
5. Activate all **World Wide Web Services** there.
6. Expand the **Application development features** node.
7. Activate **ASP.NET 4.5**
8. Expand the **General HTTP features** node
9. There, activate the **static content**.
10. Expand the **Web administration tools** node.



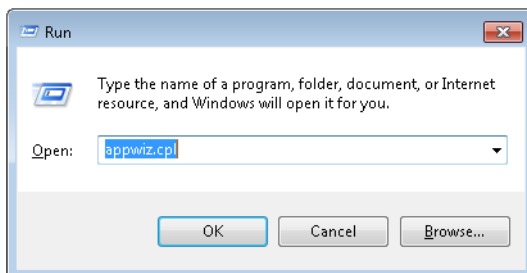
11. Optionally, activate the IIS administration console there.
12. Expand the **Application development features** node.
13. Activate the `WebSocket-Protokoll`.
14. Click on **OK**.

## WINDOWS 10

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.



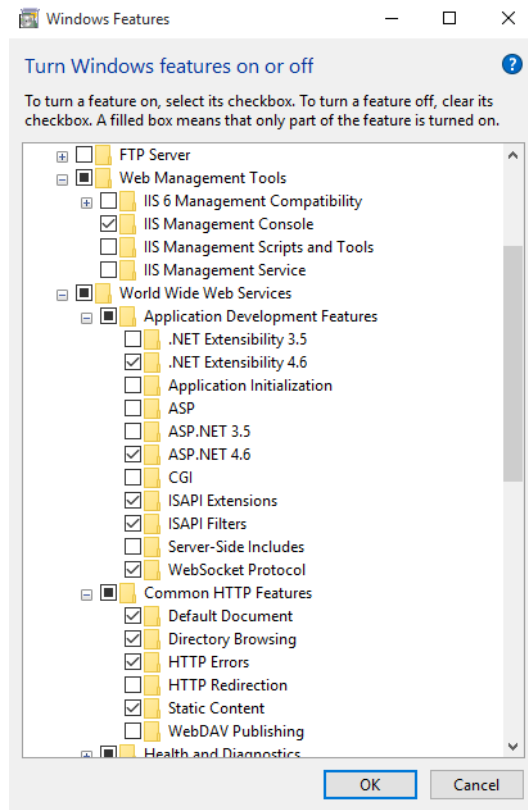
2. Enter `appwiz.cpl` in the input field.

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** in this node.
5. Activate all `World Wide Web Services` there.
6. Expand the **Application development features** node.
7. Activate `ASP.NET 4.7`
8. Expand the **General HTTP features** node
9. There, activate the `static content`.
10. Expand the **Web administration tools** node.
11. Optionally, activate the `IIS administration console` there.
12. Expand the **Application development features** node.
13. Activate the `WebSocket-Protokoll`.
14. Click on **OK**.

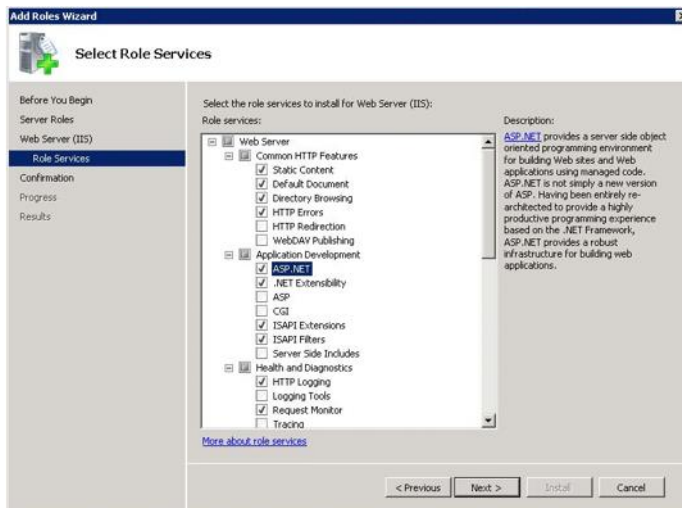
## WINDOWS SERVER 2008 R2

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

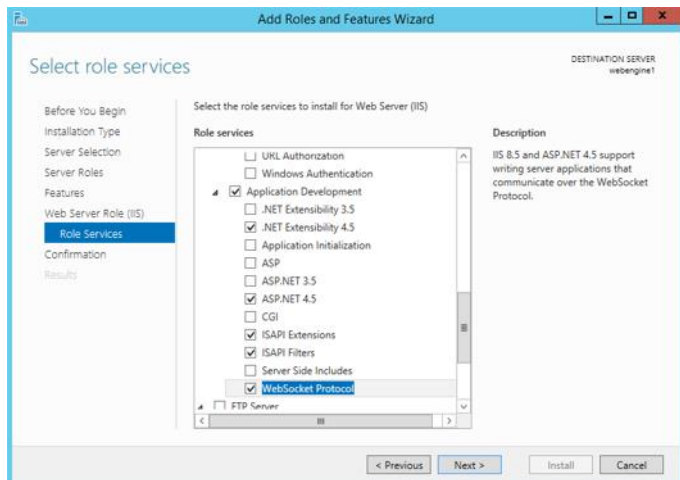
**Attention:** Do not deactivate any role services that have already been pre-selected by Microsoft.

**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.



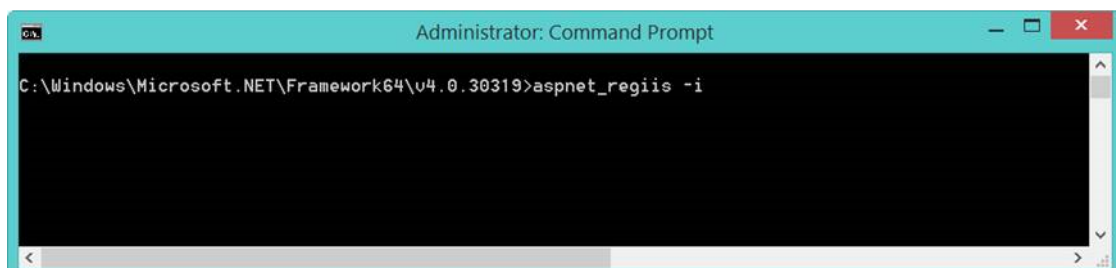
2. Expand the **Application development** node.
3. Activate the following role services:
  - NET expandability 4.5
  - ASP.NET 4.5
  - ISAPI extension
  - ISAPI filter
  - WebSocket protocol

### 7.1.1 .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:

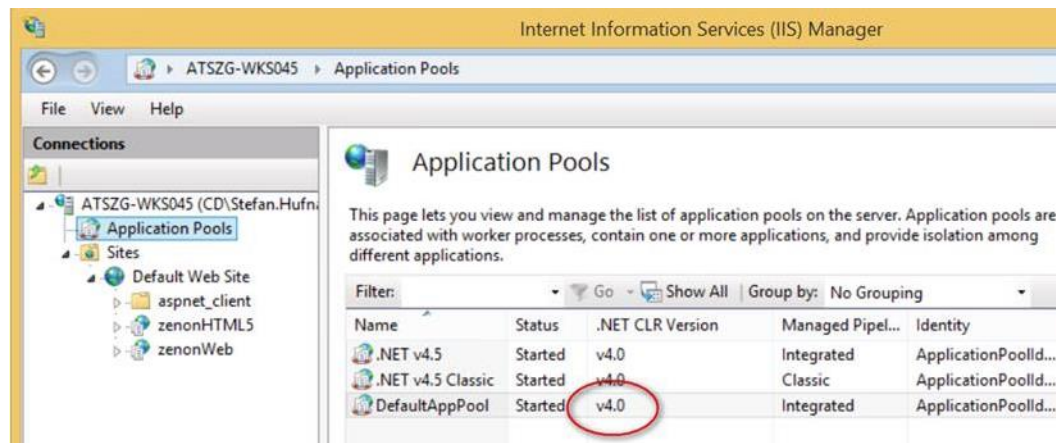
1. Open the Windows command prompt with the `as administrator` option.
2. Switch to the Microsoft.NET installation directory with the highest version number.
3. Enter command **aspnet\_regiis -i**.



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

4. Ensure that the Application Pool on the IIS in which the HTML Web Engine is operated uses the current .NET version.

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



## 8. SCADA Runtime Connector

The **SCADA Runtime Connector** must also be started on zenon Runtime, as soon as interaction with the HTML Web Engine is required. The **SCADA Runtime Connector** is also installed when zenon Runtime is installed. The interaction starts with the user authentication for the first HTML web client.

The SCADA Runtime Connector can be started manually or automatically:

- ▶ Manually:
  - Start the application in the **Startup Tool** under **Tools**. Select, under **Available applications (current folder)**, the **SCADA Runtime Connector** entry. Confirm the selection by clicking on **Start**.
  - Start the application directly from the folder `%programfiles(x86)%\Common Files\COPA-DATA\Connectors\zrsConnector.exe`
- ▶ Automatic:
  - Activate Autostart for the Connector Container in the **Startup Tool**.

For each HTML Web Engine session, a separate **SCADA Runtime Connector** session is set up. The following are transferred in this session:

- ▶ Variables that are needed for the current screen display on the HTML client:
  - for example for the display of variable values or element dynamics. 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.

- ▶ Write set value via the SCADA Runtime Connector:  
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.

## ENCRYPTED COMMUNICATION

The TCP connection between **SCADA Runtime Connector (zrsConnector.exe)** and **SCADA Runtime Connector Client (zrsConnCli.dll)** can be encrypted with AES.

To use the encrypted communication, issue an encryption password for Runtime and Client.  
To do this:

1. In the zenon Startup Tool, enter the password in the **Network configuration** tab.  
This is also saved in zenon6.ini in encrypted form.  
Section: **[ZRSCONNECTOR]**  
Entry: **ENCRYPTION\_PWD**
2. In the **Deployment Tool** of the **HTML Web Engine**, in the **Security options** window, set the same password in the **Security options** (on page 28) tab. This is saved in encrypted form in **web.config** in the **Encryption\_Password** setting.

If, during validation, the **SCADA Runtime Connector** can be reached on the set target computer but the encryption password does not correspond, the connector test times out. You receive notification that the password set may be incorrect.

## 9. 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 means of 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 23) chapter.
- ▶ Manual login by the zenon 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.

## 10. Deployment of the Web Engine

The **zenon Web Engine Deployment Tool** offers important operations for the management of the web engine as a web application in the Internet Information Services (IIS).

To start the **Deployment Tool**:

1. Open the zenon **Startup Tool**.
2. click on the **Tools** button.
3. Under **Available Application**, select the Web Engine Deployment Tool .
4. Click on **Start**.

The tool is started



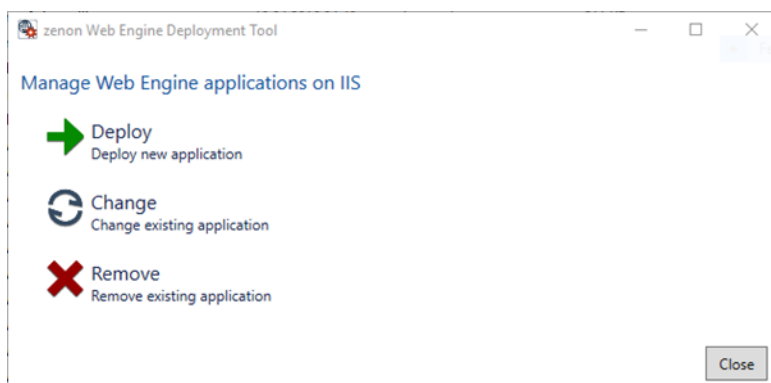
### Information

**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.

### 10.1 zenon Web Engine Deployment Tool

HTML web engine instances are administered on the IIS with the **zenon Web Engine Deployment Tool**. You can create new instances and amend or remove existing ones.

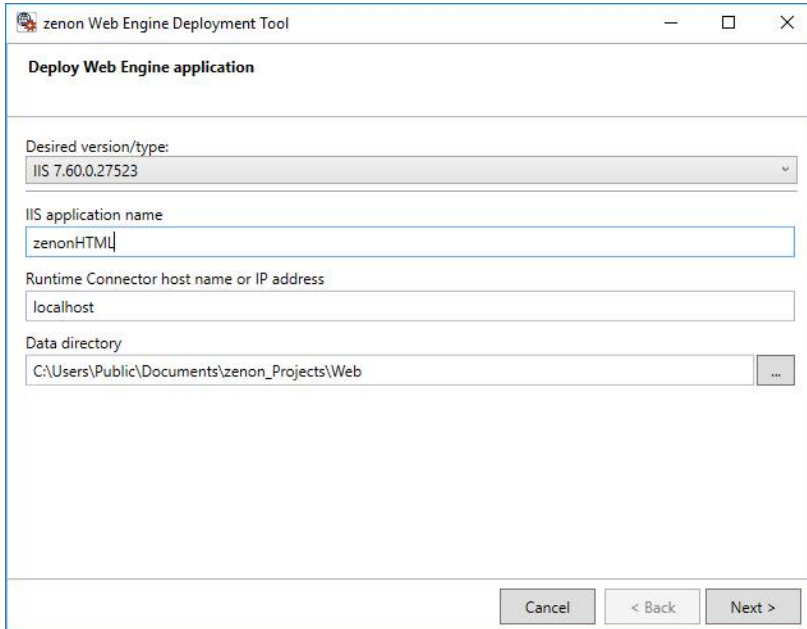


Option	Description
<b>Deploy</b>	<p>Provides a new instance of the <b>HTML Web Engine</b> on the IIS.</p> <p>The necessary options are configured in the following tabs.</p>
<b>Change</b>	<p>Updates existing Web Engine Applications.</p> <p>The following can be amended for the <b>HTML Web Engine</b> in the following tab:</p> <ul style="list-style-type: none"> <li>▶ Version.</li> <li>▶ Configuration.</li> <li>▶ SCADA Runtime Connector: Host name, IP adress.</li> <li>▶ Path of the data folder. Data Directory in which the exported project data (*.webx) is.</li> <li>▶ Security settings: User name, password or switch for automatic sign-in.</li> </ul> <p><b>Note:</b> Not available if no valid Web Engine application is available on the IIS.</p>
<b>Remove</b>	<p>Removes a running application of the <b>HTML Web Engine</b>.</p> <p>The version to be removed is selected in the following tab.</p> <p>If the web engine is to be replaced by a more recent version, use the <b>Change</b> option.</p> <p><b>Note:</b> Not available if no valid Web Engine application is available on the IIS.</p>



### 10.1.1 General settings for the Web Engine

In this dialog, you configure the general settings for the operation of the HTML Web Engine.



The options that are available depend on the option that was selected in the start dialog:

- ▶ **Deploy:** New configuration of a **HTML Web Engine**.
- ▶ **Change:** Amendment to an existing **HTML Web Engine**.
- ▶ **Remove:** Removal of an existing **HTML Web Engine**.

Option	Description
Web Engine application to change	Selection of the instance that is to be amended. <b>Note:</b> Not available with the <b>Change</b> selection in the start dialog.
Web Engine application to change	Selection of the instance that is to be deleted. <b>Note:</b> Not available with the <b>Remove</b> selection in the start dialog.
Desired version/type	Selection of the version from the drop-down list. <b>Note:</b> Only available for <b>Deploy</b> and <b>Change</b> .
IIS application name	Entry of the desired name for the Web Engine application This name will be part of the URL under which the HTML5 web page will later be reached. Example: <i>https://ServerAddress/&lt;ApplicationName&gt;</i> <b>Note:</b> Only available for <b>Deploy</b> and <b>Remove</b> (display only).
Application version	zenon version of the instance (display only). <b>Note:</b> Only available for <b>Remove</b> .
Runtime Connector host name or IP address	Enter the host name or the IP address of the computer on which the zenon Runtime and the SCADA Runtime Connector are installed. <b>Note:</b> Only available for <b>Deploy</b> and <b>Change</b> .
Data directory	Folder from which the Web Engine is to read the exported project data. <b>Note:</b> The webx file generated by the <b>Web Engine Compiler</b> must be available in this folder. When the HTML Web Engine is first accessed, the first webx file in the file list is loaded. If a webx file that was loaded by the web engine is amended or deleted, the Web Engine automatically restarts and in turn loads the first webx in the folder. <b>Default folder:</b> C:\Users\Public\Documents\zenon_Projects\Web <b>Note:</b> Only available for <b>Deploy</b> and <b>Change</b> .

## NAVIGATION

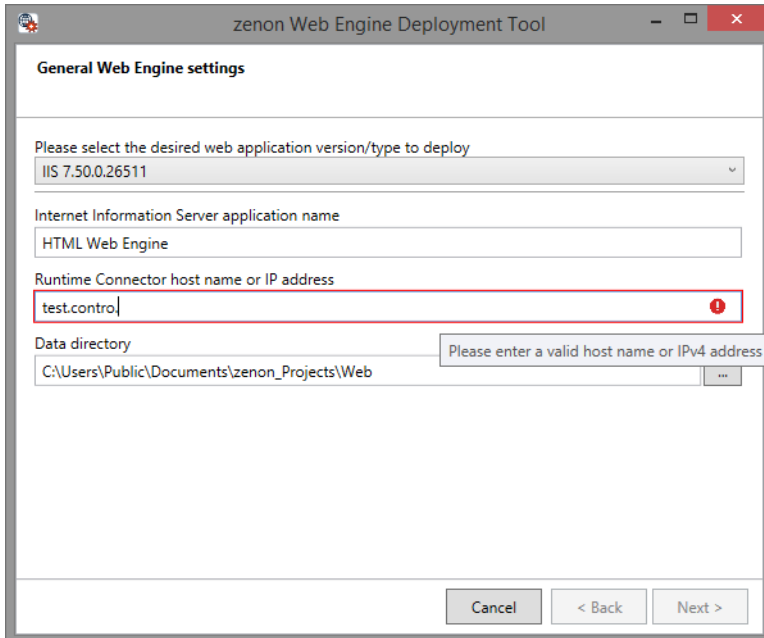
<b>Cancel</b>	Discards changes and closes the dialog.
<b>Back</b>	Goes back one tab in the tool.

**Next**

Goes forward one tab in the tool.

## CHECKING OF THE ENTRY

This is checked during entry:



The screenshot shows the 'General Web Engine settings' window of the 'zenon Web Engine Deployment Tool'. The window has a title bar with standard Windows controls. The settings are as follows:

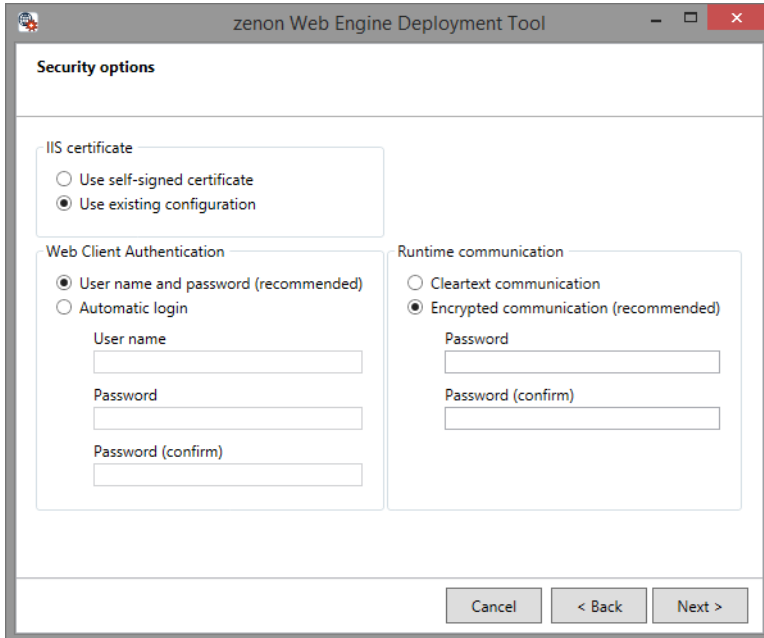
- Please select the desired web application version/type to deploy:** A dropdown menu showing 'IIS 7.50.0.26511'.
- Internet Information Server application name:** A text box containing 'HTML Web Engine'.
- Runtime Connector host name or IP address:** A text box containing 'test.control'. This field is highlighted with a red border and a red warning icon (an exclamation mark inside a circle) on the right side.
- Data directory:** A text box containing 'C:\Users\Public\Documents\zenon\_Projects\Web'. To the right of this text box is a tooltip that says 'Please enter a valid host name or IPv4 address'.

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

If incorrect entries are detected, these are shown with a red warning signal. If you move the mouse over the warning signal, you get further information in a tool tip.

### 10.1.2 Security settings

In this dialog, you configure the security settings for the operation of the HTML Web Engine.



The screenshot shows the 'zenon Web Engine Deployment Tool' window with the 'Security options' tab selected. The dialog is divided into three main sections: 'IIS certificate', 'Web Client Authentication', and 'Runtime communication'. In the 'IIS certificate' section, 'Use existing configuration' is selected. In the 'Web Client Authentication' section, 'User name and password (recommended)' is selected, with input fields for 'User name', 'Password', and 'Password (confirm)'. In the 'Runtime communication' section, 'Encrypted communication (recommended)' is selected, with input fields for 'Password' and 'Password (confirm)'. At the bottom, there are three buttons: 'Cancel', '< Back', and 'Next >'.

zenon Web Engine Deployment Tool

**Security options**

**IIS certificate**

- ☐ Use self-signed certificate
- ☒ Use existing configuration

**Web Client Authentication**

- ☒ User name and password (recommended)
- ☐ Automatic login

User name

Password

Password (confirm)

**Runtime communication**

- ☐ Cleartext communication
- ☒ Encrypted communication (recommended)

Password

Password (confirm)

Cancel < Back Next >

## IIS CERTIFICATE

zenon HTML Web Engine communication is always via a secure (HTTPS, port 443) connection.

In this area, you define whether the **Deployment Tool** uses a self-signed certificate for communication. If there is not yet a self-signed certificate, it is created by the **Deployment Tool**. This certificate is assigned to the IIS.

**Note:** A security certificate is a mandatory requirement for communication between the zenon Web Server and zenon Web Client.

Option	Description
Use self-signed certificate	Activate this option if you want to create a temporary, self-signed certificate. This option is offered as a default for the first <b>Deploy</b> . <b>Note:</b> This option is mandatory if there is no certificate present on the IIS.
Use existing certificate	Select this option if there is already a valid configuration. If there is already a valid configuration, this option is offered as a default. <b>Note:</b> Use of an official certificate from a certification body is recommended. <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>

## WEB CLIENT AUTHENTICATION

In this area, you define how the authentication of the zenon Web Client is to be carried out.

Option	Description
User name and password (recommended)	Input field for authentication of the zenon Web Client. The zenon Web Client is authenticated by manual entry of user name and password.  <b>Note:</b> The user name and password must be entered in a zenon <b>login</b> screen.
Automatic login	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.  <b>Attention:</b> When this option is used, each zenon Web Client receives a connection to zenon Runtime.
User name	Input field for zenon user name. Enter the desired user name here.
Password	Input field for zenon user password. Enter the user password here.  <b>Note:</b> Not available if <code>User name and password</code> has been selected for <b>Web Client Authentication</b> .
Password (confirm)	Enter the user password again.  <b>Note:</b> Not available if <code>User name and password</code> has been selected for <b>Web Client Authentication</b> .

## RUNTIME COMMUNICATION

Type of communication to the web engine.

Option	Description
Cleartext communication	Communication to the web engine is implemented by means of plain text without encryption.
Encrypted communication (recommended)	Communication to the web engine is encrypted.  <b>Note:</b> The settings for Runtime are configured in the <b>Startup Tool</b> in <b>Network configuration</b> tab with the <b>Encrypt Runtime Connector communication</b> property. The passwords for Runtime and the HTML Web Engine must correspond.
Password	Input field for password for secure communication. Enter the user password here.
Password (confirm)	Enter the user password again.

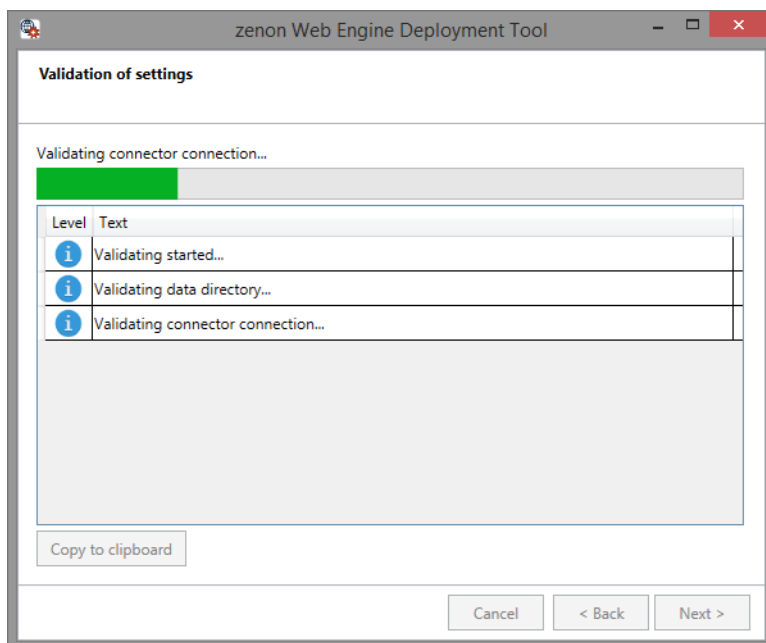
## NAVIGATION

<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.

### 10.1.3 Validation of the settings

The settings are validated in this dialog. The progress is shown with a green bar during validation.

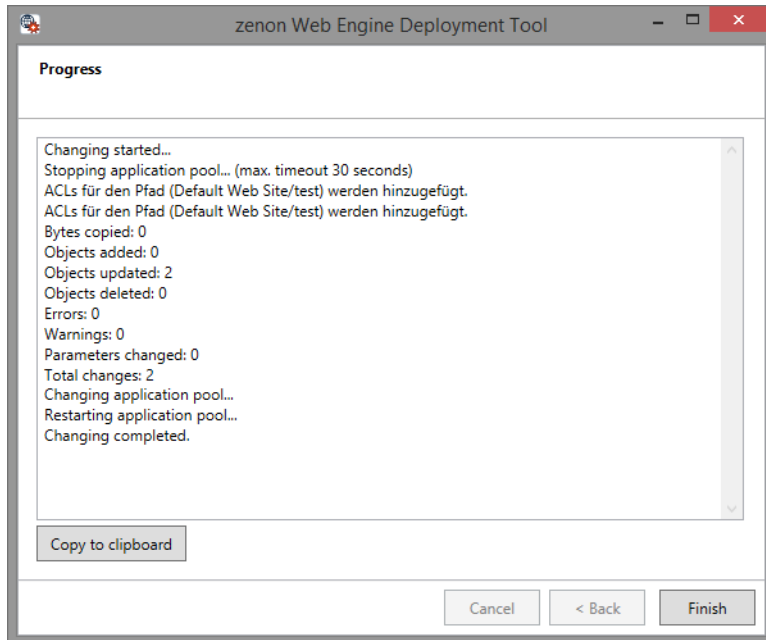
The result of the validation is shown in a list.



Copy the output to the clipboard by clicking on the **Copy to clipboard** button.

### 10.1.4 Progress

In this dialog, you see the progress of the **Web Engine Deployments** on the IIS.



Copy the output to the clipboard by clicking on the **Copy to clipboard** button.

Once the procedure has been completed, click on the **Finish** button to close the Deployment Tool.

## 11. 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.

**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.



**Attention**

*Only the `standard` screen type can be used as a start screen for the HTML web engine. Special screen types are not suitable.*

## 11.1 Supported functionalities for HTML visualization

For HTML5 visualization, basic elements, properties and functions are available:

### GENERAL

Functionality	Description
<b>Variables</b>	<ul style="list-style-type: none"> <li>▶ Display of static and dynamic values.</li> <li>▶ <b>Write set value</b> in the HTML Web Engine directly</li> <li>▶ Making the element display dynamic with variable values. For example <b>Visibility/flashing</b>, rotation, positioning, size adjustment...</li> <li>▶ Limit values for the dynamic aspects of the element display (such as <b>Limit value color</b>, <b>Limit value text</b>) are fundamentally supported.</li> </ul> <p><b>Attention:</b> Limit value information of reaction matrices is not supported!</p>
<b>Font types and font lists.</b>	<ul style="list-style-type: none"> <li>▶ Selection and display of any desired font lists that are available on the system. <b>Note:</b> Selected font types must be available on both the project configuration computer and on the zenon Web Client. The steps must be defined in the local project.</li> <li>▶ Display in <code>Normal</code> font style, <code>italic</code> and <code>bold</code>.</li> <li>▶ Selection and display of the font in accordance with the font list.</li> <li>▶ Online switching of the font list.</li> </ul> <p><b>Note:</b> The first font list of the zenon project is shown when a session starts</p>

## FRAMES AND SCREENS

Screen/Frame	Description
<b>Frame</b>	<ul style="list-style-type: none"> <li>▶ Calling up rectangular frames at an absolute position.</li> </ul> <p><b>Attention:</b> Frame names must be unique. Capitalization is not taken into account.</p>
<b>Screens, general:</b>	<ul style="list-style-type: none"> <li>▶ Display of screens in the size of the linked frame.</li> <li>▶ Display of background color and background graphics.</li> <li>▶ Execution of a start and end function for a screen.</li> </ul>
<b>Standard screen</b>	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> </ul>
<b>Login screen</b>	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> <li>▶ User authentication with the screen-type-specific elements <b>Enter user name</b> and <b>Enter password</b> or <b>Login</b> command.</li> </ul>
<b>AML screen type</b> (on page 42)	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> <li>▶ Display of dynamic AML lists. Dynamic means that the data displayed is updated.</li> </ul>
<b>CEL screen type</b> (on page 42)	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> <li>▶ Display of dynamic CEL lists. Dynamic means that the data displayed is updated.</li> </ul>
<b>HTML screen type</b> (on page 37)	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> <li>▶ Display of the elements specific to the screen type, such as web browser</li> </ul>
<b>ETM screen type</b> (on page 47)	<ul style="list-style-type: none"> <li>▶ Display of this type of screen.</li> <li>▶ Static display of simple line diagrams. Static means the the data displayed is not updated.</li> </ul>

## SCREEN ELEMENTS

### STATIC SCREEN ELEMENTS

The following are generally supported:

- ▶ 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:

- **Circle**

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

Notes:

Element	Description
<b>Circle</b>	<ul style="list-style-type: none"> <li>▶ Supports the <b>Invert color gradient</b> property. When selecting <code>color gradient</code> for the <b>Fill pattern</b> property, the brightness gradient of the fill pattern is shown as inverted.</li> </ul>
<b>Segment of a circle</b>	<ul style="list-style-type: none"> <li>▶ Supports the <b>Invert color gradient</b> property. When selecting <code>color gradient</code> for the <b>Fill pattern</b> property, the brightness gradient of the fill pattern is shown as inverted.</li> </ul>
<b>Polygon</b>	<ul style="list-style-type: none"> <li>▶ Supports the <b>Invert color gradient</b> property. When selecting <code>color gradient</code> for the <b>Fill pattern</b> property, the brightness gradient of the fill pattern is shown as inverted.</li> </ul>
<b>Rectangle</b>	<ul style="list-style-type: none"> <li>▶ Supports the <b>Invert color gradient</b> property. When selecting <code>color gradient</code> for the <b>Fill pattern</b> property, the brightness gradient of the fill pattern is shown as inverted.</li> </ul>

## GENERAL SCREEN ELEMENTS

The following are generally supported:

- ▶ 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).

Notes:

Element	Description
<b>Button</b>	<ul style="list-style-type: none"> <li>▶ Execution of functions of the local project. <b>Note:</b> The corresponding user level is checked for the execution of the action.</li> <li>▶ <b>Fill pattern</b> and <b>Color gradient</b> properties: <b>Color gradient</b> only has an effect if <code>color gradient</code> is selected for <b>Fill pattern</b>.</li> </ul>
<b>Dynamic text</b>	<ul style="list-style-type: none"> <li>▶ Display of variable information <code>variable value</code>, <b>Name</b>, <b>Identification</b>, <b>Resources label</b>, <b>Measuring unit</b> and <b>Limit value text</b> possible.</li> <li>▶ Write set value with dialog.</li> </ul> <p><b>Note:</b> The corresponding user level is checked for the execution of the action.</p>
<b>Numeric value</b>	<ul style="list-style-type: none"> <li>▶ Write set value with dialog, taking into account static setpoint limits.</li> </ul> <p><b>Note:</b> The corresponding user level is checked for the execution of the action.</p>

## ELEMENT GROUPS AND SYMBOLS

Functionality	Description
<b>Element group</b>	<ul style="list-style-type: none"> <li>▶ Display of element groups.</li> <li>▶ The elements contained are displayed in accordance with their configuration and supported properties.</li> </ul>
<b>Linked symbol</b>	<ul style="list-style-type: none"> <li>▶ Display of linked symbols.</li> <li>▶ Support for <b>replace linking</b> for application in the screen, whereby resulting entries must refer to resources in the local project.</li> <li>▶ The elements contained are displayed in accordance with their configuration and supported properties.</li> </ul>

## FUNCTIONS

Function	Description
<b>Screen switch</b>	<ul style="list-style-type: none"> <li>▶ Calling screens of the local project.</li> <li>▶ Support for <code>replace linking</code>, whereby resulting entries must refer to resources in the local project.</li> </ul>
<b>Close frame</b>	<ul style="list-style-type: none"> <li>▶ Closing of frames with the given frame name.</li> </ul>

<b>Write set value</b>	▶ Direct writing of pre-defined variable values.
<b>Language switch</b>	▶ Online switching of <b>language file</b> and <b>font list</b> .
<b>Switch palette</b>	▶ Online switching of the <b>color palette</b> for graphic display.
<b>Script: execute</b>	▶ Execution of functions of the local project. Non-supported functions are excluded from execution.
<b>Logout</b>	▶ Logging a user out of a zenon Web Client session and disconnecting from zenon Runtime ▶ The zenon 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**

### 11.1.1 Create, amend and call up an HTML screen

Set up an **HTML** screen and create a screen-switch function

#### CREATING A SCREEN OF THE TYPE HTML

Engineering

There are two procedures for the creation of a screen from zenon version 8.00:

- ▶ The use of the screen creation dialog
- ▶ The creation of a screen using the properties

Steps to create the screen using the properties if the screen creation dialog has been deactivated in the menu bar under **Tools, Settings** and **Use assistant**:

1. Create a new screen.  
To do this, select the **New screen** command in the tool bar or in the context menu of the **Screens** node.
2. Change the properties of the screen:
  - a) Name the screen in the **Name** property.
  - b) Select **HTML** in the **Screen type** property.
  - c) Select the desired frame in the **Frame** property.

3. Configure the content of the screen:
  - a) select menu item **Control elements** from the menu bar
  - b) Select `Insert template` in the drop-down list.  
The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.
  - c) Remove elements that are not required from the screen.
  - d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.
4. Create a screen switch function.

## HTML SCREEN

Browser window  
Typ: STATIC  
ID: 53505

Control element	Description
<b>Insert template</b>	<p>Opens the dialog for selecting a template for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined position in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the zenon screen. Elements can be moved on the screen and arranged individually.</p>

<b>Browser</b>	Control elements for the browser.
<b>Browser Window</b>	The browser is displayed.
<b>Address field</b>	Field for entry of the address (URL).
<b>Home page</b>	The start page is called up.
<b>Search forward</b>	Go forward.
<b>Search back</b>	Go back.
<b>Refresh search</b>	Refresh display.
<b>Cancel</b>	Stop navigation.
<b>Search</b>	Control elements for the search.  When clicking a link in the <b>Search</b> field, the corresponding page is shown in the browser. So e.g. in the field <b>Search</b> a navigation bar or the results of a search engine can be displayed without changing the contents, when a link is activated.
<b>Search window</b>	Display of the search.
<b>Search field</b>	Search for address or file.
<b>Home</b>	Back to home in the search area.
<b>Forward</b>	Page down in the search area.
<b>Search back</b>	Page up in the search area.
<b>Refresh</b>	Refresh display in search area.
<b>Stop</b>	Cancel search action.
<b>Filter</b>	Open filterbox.

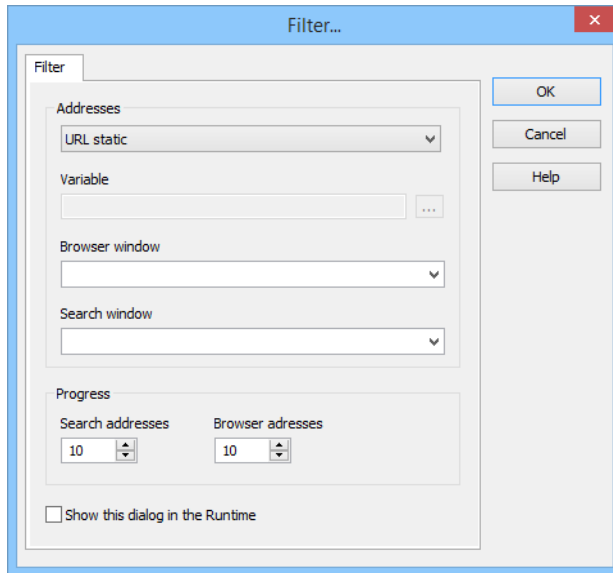
## AMEND SCREEN

To amend the screen for use with the HTML Web Engine:

1. Activate the **Available in web** property in the group **General** for this screen.
2. Note the **options for opening external web pages** (on page 40).

## CREATE SCREEN SWITCHING

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



The HTML Web Engine supports the following options:

Option	Description
<b>Addresses</b>	<p>► URL static</p> <p>The URL is set as static.</p> <p><b>Note:</b> This setting is mandatory.</p>
<b>Browser window</b>	<p>Enter the complete URL of the external web page here, including <b>https://</b></p> <p><b>Example:</b> <i>https://serveraddress</i></p>

## 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 **Browser -> Browser window**.
- 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 element 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.

### 11.1.2 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 into the project properties in the **Graphical design** group as **Start screen**.  
**Note:** You can define any desired start page for the web with an 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.
6. Export the project for HTML5 visualization.

## EXTENSION: AUTHENTICATION WITH LOGIN

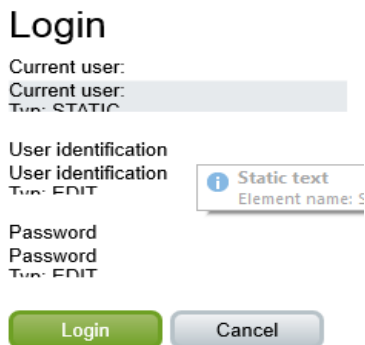
In order to be able to exchange data with zenon Runtime, the zenon Web Client must be authenticated as a user to Runtime. You can read more details about this in the following chapter: **Client authentication for a connection to Runtime** (on page 22).

This is how you expand a project for manual authentication:

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

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

3. Create a new `login` screen which you can display in the visualization.  
Use the **Screen switch** function for display.
4. Activate the **Available in web** property in the screen in the **General** group.
5. In the `login` screen, add the elements **user name**, **password**, **login** and **Cancel**.



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

The zenon 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.

### 11.1.3 AML and CEL: Supported functionalities

The **AML** and **CEL** screen types support the following functions for the HTML Web Engine:

#### ALARMS: ALARM CAUSE REQUIRED

Alarms for limit values can be created with the **Alarm cause required** property activated.  
The acknowledgment of these alarms is however not supported by the HTML Web Engine.

#### LIST DISPLAYS

Lists are subdivided into pages. A footer for navigation is shown under the list.  
List entries can be called up by clicking on the symbols. The number of the list entries shown can be defined by clicking on the drop-down list.

#### SORTING IN RUNTIME

Lists in AML and CEL can be shown in sorted form.  
To change the sorting of a list, click on the column title.  
Clicking switches between:

- ▶ Ascending
- ▶ Descending
- ▶ Standard (as supplied in zenon Runtime)

The behavior of the header, the sorting and the column widths is configured in the zenon Editor in the project properties.

## SORTING OF TEXT

Text is sorted according to natural sorting:

- ▶ alphabetic sequence
- ▶ Figures with several digits are seen as a character

Example:

- ▶ Alphabetic sorting: 1, 11, 2, 3, 33, 4
- ▶ Natural sorting: 1, 2, 3, 4, 11, 33

## COLUMN LABELING

The **Identification** and **Resources label** columns are shown with the labeling **Identification** and **Resource Label**. The language of the texts used in these columns can be switched.

## LANGUAGE SWITCHING IN RUNTIME

Language switching is available for the following columns of the AML and CEL:

- ▶ **Text**
- ▶ **Identification**
- ▶ **Resources label**
- ▶ **Measuring unit**

**Note:** Language switching is carried out for each cell individually. If switching takes place in Runtime, the switching to the new language can take some seconds.

## TIME FORMATS

Date and time in AML and CEL are shown in the localized display of the respective client. In doing so, the **UTC-DateTime** is transferred and reformatted on the basis of the settings of the local computer.

You can find further information and examples in the **Runtime** manual, in the **Handling of date and time** chapter.

## Properties and options

The HTML Web Engine supports the following properties and options for control elements, screen switching and project properties:

### AML AND CEL SCREEN SWITCH FUNCTION:

Tab	Group	Settings and notes
<b>General</b>	<b>Variable filter</b>	<ul style="list-style-type: none"> <li>▶ <b>Variable name</b></li> <li>▶ <b>Identification</b></li> </ul> <p><b>Note:</b> Capitalization is not taken into account.</p>
	<b>Alarm type (AML only)</b>	<p>Options:</p> <ul style="list-style-type: none"> <li>▶ <b>Only non-acknowledged alarms</b></li> <li>▶ <b>Only cleared alarms</b></li> <li>▶ <b>Only current alarms</b></li> </ul> <p><b>Note:</b> Other settings are ignored.</p>
	<b>Origin of the data</b>	<p>Settings are ignored.  <b>Historical data</b> from zenon Runtime is always used.  Maximum: 65535</p>
	<b>Runtime settings</b>	<p>Settings are ignored.  The <b>Show list without refresh</b> list is always used.  The list entries that were present at the time of the screen switching in zenon Runtime are shown.</p>
<b>Time</b>	<b>Filter</b>	<p>Options:</p> <ul style="list-style-type: none"> <li>▶ <b>No time filter</b></li> <li>▶ <b>Absolute time period</b></li> <li>▶ <b>Relative time period</b></li> </ul>
	<b>Settings</b>	<p>The <b>Preset</b> option only.  All other settings are ignored.</p>

<b>Column settings</b>	Columns	<ul style="list-style-type: none"> <li>▶ <b>Alarm condition</b> (Including display by means of circle symbol or graphics file.)</li> <li>▶ <b>Time received</b></li> <li>▶ <b>Time cleared</b> (AML only)</li> <li>▶ <b>Time acknowledged</b> (AML only)</li> <li>▶ <b>Text</b></li> <li>▶ <b>Variable name</b></li> <li>▶ <b>Value</b></li> <li>▶ <b>Measuring unit</b></li> <li>▶ <b>User - full name</b></li> <li>▶ <b>Computer name</b></li> <li>▶ <b>Comments</b> (AML only)</li> </ul> <p><b>Note:</b> The set display sequence is taken into account as follows.</p> <p>The column labeling can be edited and the language can be switched.</p>
	Table settings	<p><b>Always active:</b></p> <ul style="list-style-type: none"> <li>▶ <b>Use alternating background colors</b></li> <li>▶ <b>Display grid</b></li> <li>▶ <b>Sort descending</b></li> </ul> <p><b>Note:</b> Color palette switching is supported for:</p> <ul style="list-style-type: none"> <li>▶ <b>Row color 1</b></li> <li>▶ <b>Row color 2</b></li> </ul>
<b>Equipment Modeling</b>		From local and global project.

## CONTROL ELEMENTS FOR THE ALARM MESSAGE LIST SCREEN TYPE

Group	Subgroup	Settings and notes
Header and grid	Header	<p><b>Show header:</b> Setting always active.</p> <p><b>Display style:</b> Setting always standard.</p> <p><b>Fill color:</b> provides background color. Is also used in the footers in the web for:</p> <ul style="list-style-type: none"> <li>▶ Static/fixed color. <ul style="list-style-type: none"> <li>▶ Color palette and switching of color palettes.</li> </ul> </li> </ul> <p><b>Font</b> is also in the footer in the web Applied for:</p> <ul style="list-style-type: none"> <li>▶ Static selection.</li> <li>▶ Switching of font lists.</li> </ul> <p><b>Text color</b> is also in the footer in the web Applied for:</p> <ul style="list-style-type: none"> <li>▶ Static/fixed color.</li> <li>▶ Color palette and switching of color palettes.</li> </ul>
Fill	Fill	<p><b>Text color</b> is used for:</p> <ul style="list-style-type: none"> <li>▶ Static/fixed color</li> <li>▶ Color palette and switching of color palettes</li> </ul>
Representation	Representation	<p>Is used for:</p> <ul style="list-style-type: none"> <li>▶ Static selection</li> <li>▶ Switching of font lists</li> </ul>

## AML PROJECT PROPERTIES

Property group	Supported properties
Alarm Message List	Header AML
Data storage AML	not available.
Alarm received	All.
Alarm cleared	All.

<b>Alarm acknowledged</b>	All.
<b>Confirm alarm acknowledgement</b>	Not available. Alarms whose acknowledgment has been confirmed are not shown in the HTML Web Engine.
<b>Alarm status line</b>	not available.

## Alarm acknowledgment

Alarms can be selected and acknowledged individually. Only alarms with the **To acknowledge** property activated are supported.

For this, the following applies:

- ▶ Alarms are acknowledged using the **Acknowledge** button in the `alarm administration` screen type.
- ▶ If the **To acknowledge** property is not activated for a limit value, the **Acknowledge** button in the `alarm administration` screen is deactivated.
- ▶ The **Acknowledge all** button of the `alarm acknowledgment` screen type is not supported.
- ▶ The acknowledgment of an alarm required the necessary function authorizations for signed-in users.  
An error message is shown if this is not the case.

**Note:** Ensure that the user has the `Acknowledge alarm via Alarm Message List` screen function authorization.

You can find further information in the User administration manual in the Function authorizations chapter.

- ▶ Not supported:
  - **Comment required**
  - **Alarm cause required**

**Note:** Limit values can be configured with these properties. The acknowledgment of alarms that require these properties is not supported in the HTML Web Engine.

### 11.1.4 Screens of type Extended Trend

The `Extended Trend` screen type supports the following functionalities for the HTML Web Engine:

## OPTIONS WITH THE SCREEN SWITCH FUNCTION

Tab	Group	Settings and notes
<b>Data</b>	Origin of the data	Option: <b>Archive data</b>
	<b>Options</b>	The <b>Options</b> settings are not supported for the HTML Web Engine.
	<b>Curves</b>	Display of simple curves without further options.
<b>Display</b>	<b>Diagram name</b>	Display of the diagram name, as configured
	<b>Refresh</b>	Options in the <b>Refresh</b> properties group are not supported.
	<b>Design</b>	Options in the <b>Design</b> properties group are not supported.  A pre-defined display is shown.
	<b>Runtime</b>	The display of this dialog is not supported in the HTML Web Engine.  Filtering is not possible.
<b>X-Axis</b>	<b>X-Axis</b>	Option:  ▶ <b>Only YT display</b>  <b>Note:</b> XY display is not supported.
<b>Time</b>	<b>Filter</b>	The following are supported: ▶ <b>Absolute time period</b> ▶ <b>Relative time period</b>  All other time filters are not supported.  <b>Attention:</b> Screen switching with invalid time configurations are not available in the HTML Web Engine. Buttons with corresponding calls are deactivated.
<b>Lots</b>		The settings of the <b>Lots</b> tab are not supported for the HTML Web Engine.
<b>Column settings</b>		The settings of the <b>Column settings</b> tab are not supported for the HTML Web Engine.



<b>Printer properties</b>		The settings of the <b>Printer settings</b> tab are not supported for the HTML Web Engine.
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#### DIAGRAM CONTROL ELEMENT

Group	Subgroup	Settings and notes
<b>Darstellung</b>		The configuration of the display is not supported for the HTML Web Engine. The action is defined and fixed.
<b>Linien</b>		The configuration of the lines is not supported for the HTML Web Engine. The action is defined and fixed.
<b>Füllung</b>		The configuration of fills is not supported for the HTML Web Engine. The action is defined and fixed.

#### Data aggregation

Data is aggregated under certain conditions for display in the Extended Trend. The speed of the display via the HTML Web Engine is thus sped up so that it corresponds to that of zenon Runtime.

##### Procedure:

- ▶ The maximum number of variables to be displayed is determined by the width of the template (in pixels) on which the screen is based.
- ▶ There is no aggregation if, during an archive query, fewer variables are returned than pixels are present.
- ▶ If the number of the archive variables exceeds the column width, average values are generated. to do this, the time axis is divided into time ranges. The archive values that are transferred by Runtime are arranged into the respective time ranges. The average value within a time range is calculated using the archive values. If there is no archived value within a time range, this time range is deleted.  
**Note:** The generation of the average values is not just carried out for numeric values, but also binary variables.
- ▶ Unnecessary variables continue to not be taken into account, because these are not required for the current display. This reduces background calculations, saves computer processing power and speeds up the switching time.  
This happens regardless of the number of archive values and the average value calculation. To do this, 3 archived values of a variable that are consecutive in terms of time are analyzed. If all 3 variables have the same value, the average variable is removed.  
If, for example, a recorded archive variable has the same value over the queried time period, only 2 variables (start and end) are displayed.

**Note:** When generating average values, the trend line is generally shown differently to with raw values.

### 11.1.5 Automatic script call when starting a zenon Web Client session

A script can be called up automatically when starting an HTML web client session. A special start page can thus be prescribed for the web application, for example.

The following script name is reserved for the script: `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.

### 11.1.6 Individual script call by means of URL expansion when starting a zenon Web Client session

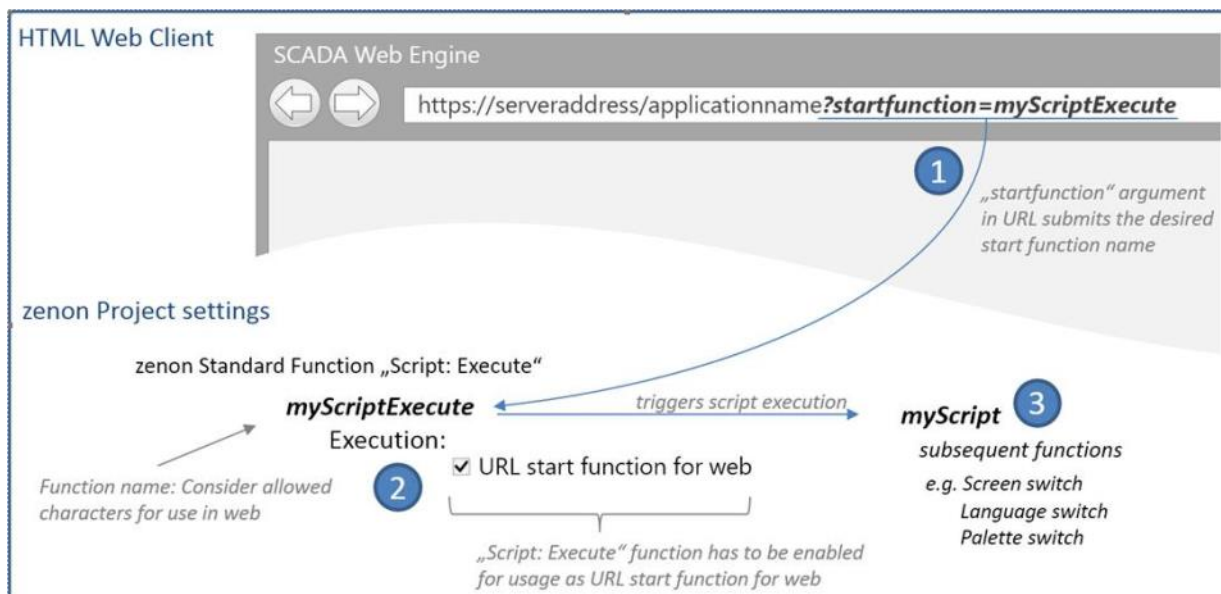
The HTML Web Engine allows the individual execution of zenon functions as part of a session start for an HTML web client. The function is executed by a script that is started using the **Script: execute** function. The name of the desired start function is transferred in the URL for the call to the web page with the **startfunction** argument. 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 compilation for the web.

Process for the application of the functionality:

1. The web page is called up with the additional **startfunction** argument for the call of the desired **Script: execute** function:  
The call is made using the function name.

2. 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 naming the function name in the web:

Permitted	Forbidden
Alphanumeric characters (0-9, a-z, A-Z)	Umlauts
\$ - . + ! * ' ( ) ,	ASCII control characters ( <b>0x00-0x1F;0x7F</b> )
	Reserved characters ( <b>&amp; / : ; ? @</b> )
	Unclear characters (such as spaces and <b>" ' &lt; &gt; # % { }</b> <b>! \ ^ ~ [ ]</b> )

## 12. Compile project for web

With the **Web Engine Compiler**, the data that the HTML Web Engine needs to provide HTML5 content for the zenon Web Client is provided from a zenon project. When translating this project data, the **Web Engine Compiler** 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.

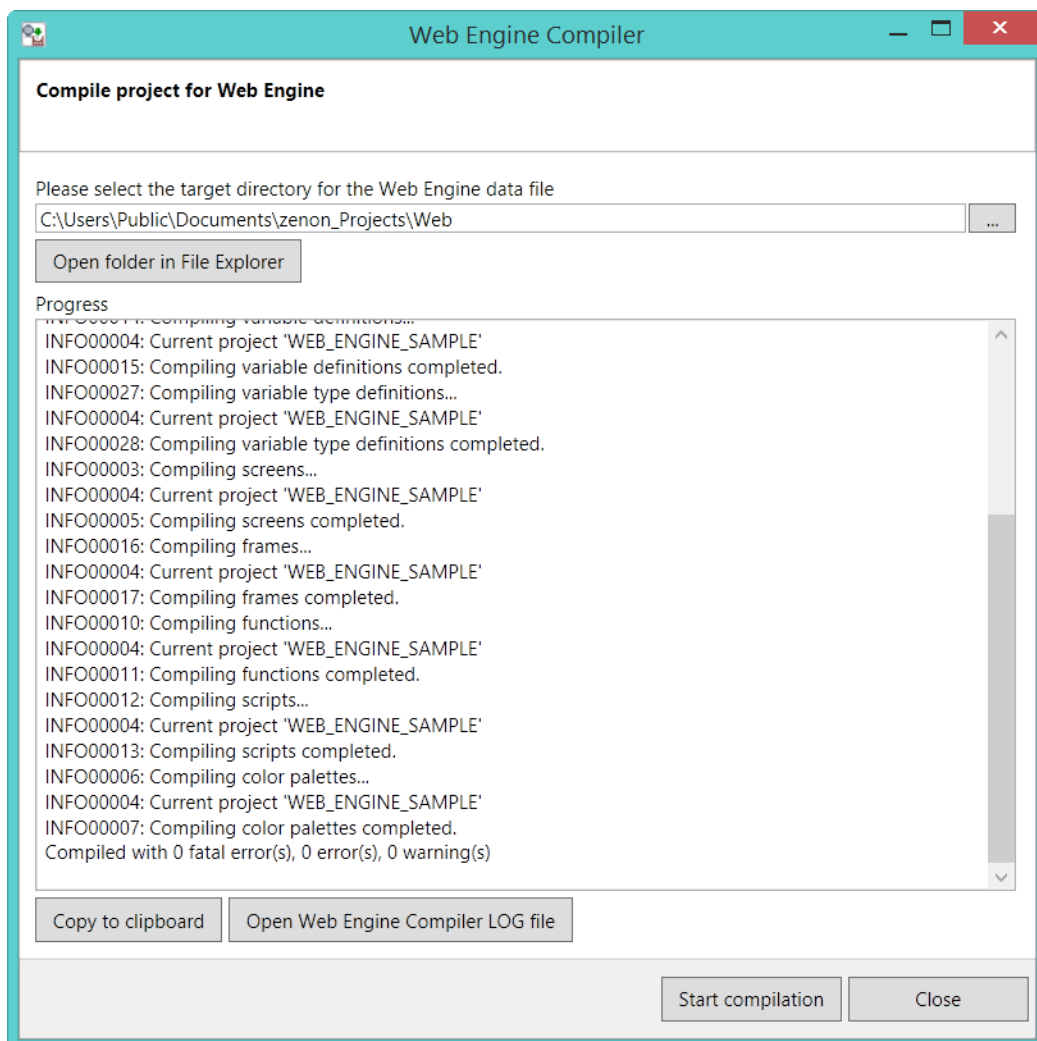
To open the web engine compiler:

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

The dialog to compile the project is opened.

Note: This is only available in English.

### HTML WEB ENGINE COMPILER DIALOG.



Option	Description
<b>Please select the target directory for the Web Engine data file</b>	Select a directory to save the Web Engine file here. Click the ... button and a dialog opens to select a folder.
<b>Open folder in File Explorer</b>	Opens the selected folder in the Windows Explorer.
<b>Progress</b>	Shows warnings, error messages and information during compilation.
<b>Copy to clipboard</b>	Copies the content of the <b>Progress</b> output window to the clipboard.
<b>Open Web Engine Compiler LOG file</b>	Opens the LOG file for the <b>Web Engine Compiler</b> . This contains the messages from the <b>Progress</b> output window.
<b>Start compilation</b>	Starts the compilation process.
<b>Close</b>	Closes the <b>Web Engine Compiler</b> .

## 13. Process of an HTML web engine session

The HTML visualization is available after a successful compilation of the project data.

To call up the web page:

1. Open an HTML 5-compatible web browser.  
You can find the list of recommended web browsers in the System requirements (on page 12) chapter.
2. Enter the 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 zenon 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 22).
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 is closed, view is updated or the URL is entered again (among other things).

## 14. System diagnosis and troubleshooting

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. The logging stage of the error messages depends on how the HTML5 web page is called up:

- ▶ Local web browser: You receive detailed messages.  
To do this, the web browser must be on the same computer (with the same IP address) on which the Web Engine is being operated.
- ▶ Remote browser: General messages.  
This is applicable when being called up from a different device and/or a different IP address.

### CHECKLISTS

#### FOR ERROR-FREE SYSTEM OPERATION

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

- ▶ HTML Web Engine has been installed on the IIS. The web engine deployment was carried out without any errors. The web server is in operation.
- ▶ Visualization data is generated with the **Web Engine Compiler**. There are no errors during the compilation process. The resultant data of the **Web Engine Compilers** is ready for access by the Web Engine.  
**Note:** The occurrence of warnings does not influence the ability of the HTML Web Engine to run in principle. However, there can be limitations to the configured functionality depending on the type of warning
- ▶ The versions of **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

Please note when transferring process data:

- ▶ zenon Runtime and SCADA Runtime Connector have been started. The SCADA 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.
- ▶ The Users who need to be authenticated must be available in zenon Runtime.