OPC Gateway Server

User's Manual

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This manual is a product of iXTS GmbH, Germany

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Confidentiality

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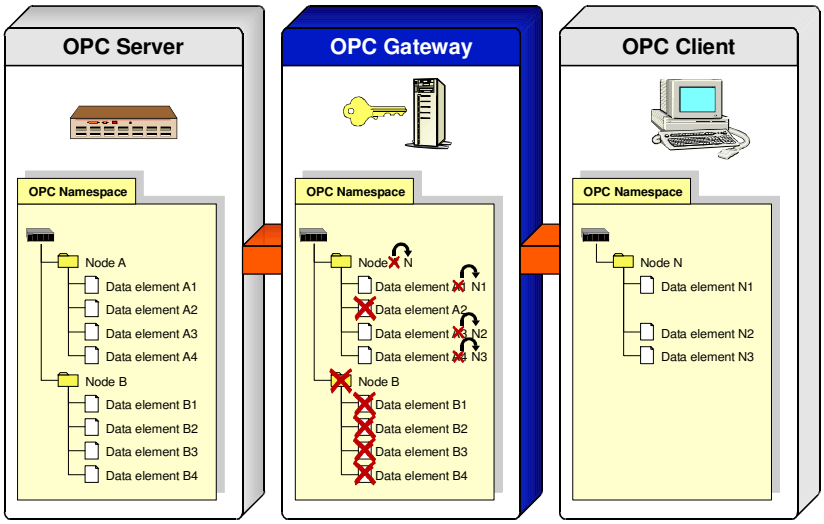
Introduction

What is the OPC Gateway Server

To make it as short as possible: The *OPC Gateway Server* is an OPC DA 2.05 Server which forwards a subset of OPC data items from a so-called source OPC server to OPC clients. It acts as a gateway between the source server and the clients which allows to hide and/or rename OPC elements of the OPC namespace.



Who should use this manual

This manual is intended for all users of *OPC Gateway Server*. It explains how to install and configure the software, as well as how to perform common tasks.

Overview of the manual

This manual consists of several chapters and is structured as follows:

Introduction: This introductory chapter

Getting started: Setting up the *OPC Gateway Server* in a couple of minutes

System description: A short technical description of the *OPC Gateway Server*

User Interface: A detailed description of the user interface, including all dialogs and menus.

Diagnostics: Makes familiar with the logging features of the *OPC Gateway Server*

OPC Compliance

The *OPC Gateway Server* is compliant to the *OPC DA 2.05 Specification*. It supports all required interfaces and additionally the optional *IOPCBrowserServerAddressSpace* interface. Public groups are *not* supported, as well as the legacy interfaces *IOPCAsyncIO* and *IDataObject*, as these are more a relict from the 1.0 specification and are usually not used in OPC DA2.05 servers and clients.

As an additional feature the *OPC Gateway server* can on the server side make use of the *IOPCItemSamplingMgt* interface defined in the OPC DA 3.0 specification if the remote server supports it. However an entire implementation of the OPC DA 3.0 standard is not provided, i.e. the *OPC Gateway Server* itself does NOT provide this interface or any other OPC DA 3.0 functionality to the connected clients.

Compliance is tested using the official OPC Compliance Test Tool V 2.10 from the OPC Foundation.

References

To learn more about OPC visit the website of the OPC Foundation at: http://www.opcfoundation.org.

The *OPC Gateway Server* is based on the *OPC Data Access Custom Interface Specification* Version 2.05 which is also available from the OPC foundation. The description of the IOPCItemSamplingMgt interface can be found in the *OPC Data Access Custom Interface Specification* Version 3.00.

Getting started

System requirements

The *OPC Gateway Server* hat both Software and Hardware minimum system requirements. These requirements must be met in order for the server to work properly.

Software requirements

The *OPC Gateway Server* requires, at a minimum, the following software:

- Micosoft Windows 2000, Microsoft Windows XP or higher
- Internet Explorer 4.01 Service Pack 1 or better
- OPC DA 2.0x client and server applications

Hardware requirements

The *OPC Gateway Server* requires, at a minimum, the following hardware:

- Intel Pentium II 500 MHz
- 128 MB RAM
- 20 MB fee hard disk space

Installation

Once you are certain that your system meets the system requirements, you are ready to install the *OPC Gateway Server*.

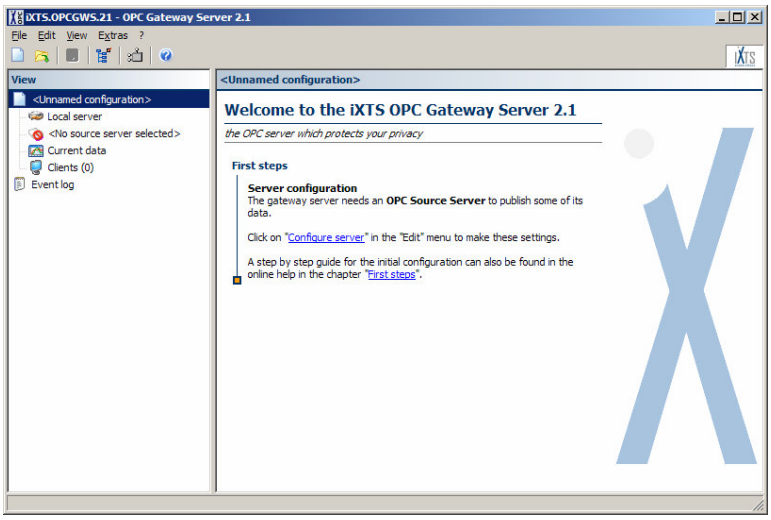
To install the *OPC Gateway Server* double-click **setup.exe** on your *OPC Gateway Server* media and follow the instructions on the screen.

The setup includes the *OPC Core components* from the OPC Foundation, which are necessary for any OPC application to work properly. If these components are *not* installed on your system, the *OPC Gateway Server* will not work correctly (neither any other standard OPC application).

The *OPC Gateway Server* may be installed and executed several times on the same system. Every instance of the *OPC Gateway Server* will be registered as an individual OPC DA 2.05 server in the system and will have its own program settings. The term “instance“ refers here to each copy of the file “OPCGatewayServer.exe” in an individual directory.

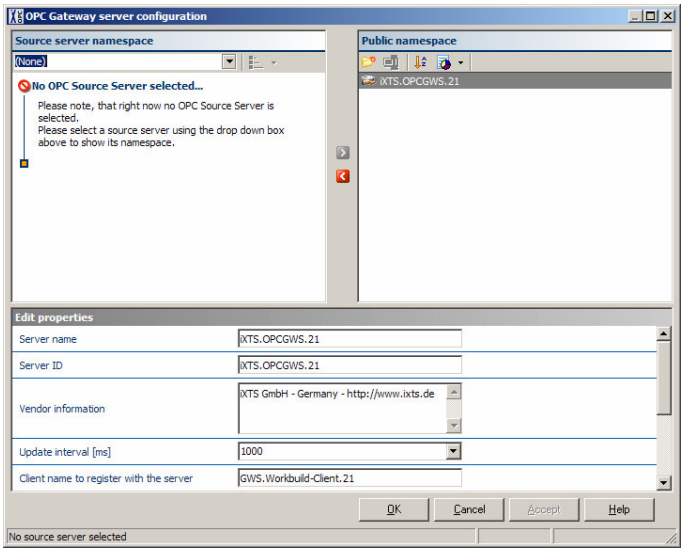
First steps

After installing and starting the *OPC Gateway Server* for the first time you will see the following screen.



To start working with the gateway server an OPC Source Server needs to be defined and the desired subset of the source servers namespace needs to be configured.

To select the server and make all necessary setting select **Configure Server** from the **Edit** menu or click to the corresponding link in the Welcome panel or on the  icon in the toolbar. The following dialog will appear:



Selecting the source server

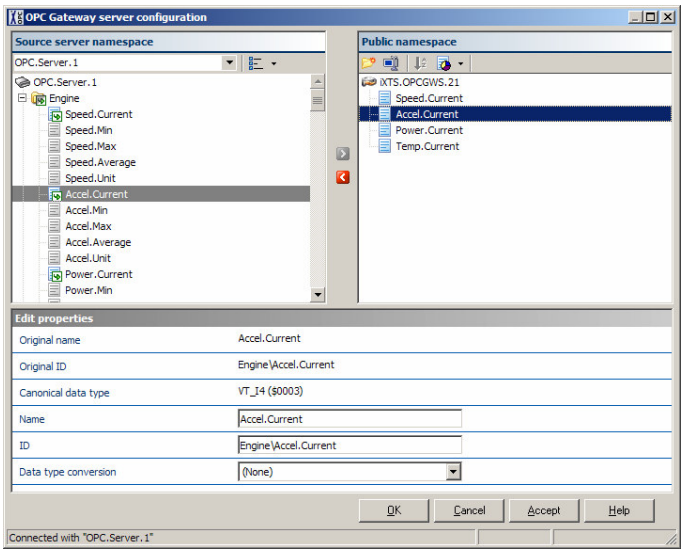
Now first an OPC source server must be selected using the dropdown list in the upper left side of the dialog.

To connect to a remote OPC source server, which is not listed in the dropdown, you mal also enter its IP address in the edit control. If a system with the provided address is available in the network, a list of available OPC servers will be acquired and shown.

When a source server has been selected its namespace will be retrieved and filled into the tree view on the left side of the dialog.

Setting up the public namespace

Now all items and/or branches from the source server that should be available at the *OPC Gateway Server* can be dragged from the left tree view to the right tree view. The right tree view shows the namespace of the *OPC Gateway Server* as it will be available for OPC Clients connecting to it.

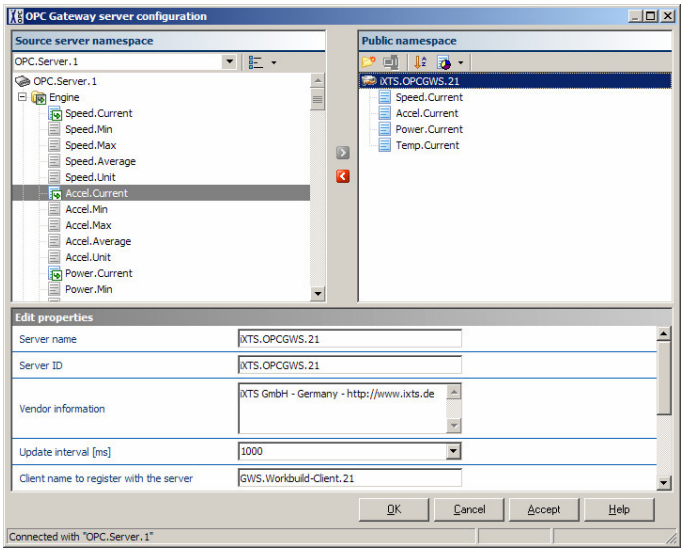


Published elements and branches can also be renamed by highlighting them in the right tree view and selecting the command **Rename (Alias)** from the pop-up menu that will be shown on a right mouse click.

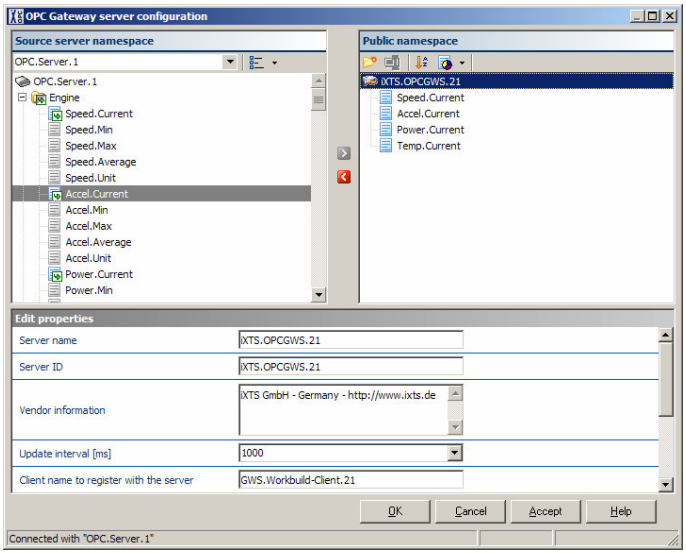
Setting up the server name and ID

The *OPC Gateway Server* is an OPC server on its own. You may change the server identification by selecting the root node of the *published namespace* and changing the respective properties in the property editor below.

The server name, the server ID and the vendor information can be set according to the personal needs. The format of server name is not standardized, so any combination of chars can be set here. The format for the server ID is defined in the OPC specification and should therefore have the format *<Vendor>.<Servername>* or *<Vendor>.<Servername>.<Version>*. As the server ID is also used to build unique identifiers for the elements in the published name space, the ID must also meet some internal restrictions, i.e. it may not contain one of the reserved characters ':', '\' and ' '.



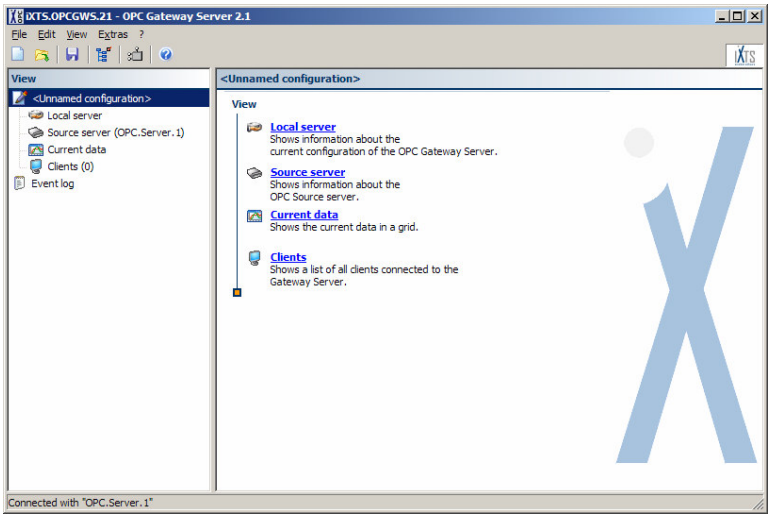
Setting up the update interval



The update interval determines how often the data of the OPC Gateway Server should be updated and hence this interval will be also be used as the update interval for the OPC source server. The default is once per second (each 1000ms). To change this value, select the root node in the *published namespace* and change the respective value in the property editor.

Accepting changes

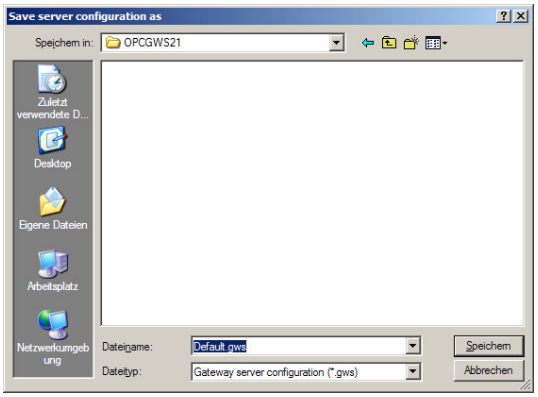
After confirming all changes and closing the dialog the server settings will be changed and the new OPC server is available in the network.



By selecting the **Local server**, **Source server, Current data** or **Clients** screen some status information can be displayed. If something went wrong the respective error messages can be found in the **Event log**.

Saving the configuration

To store the configuration for the next time the *OPC Gateway Server* will be started, select **Save** from the **File** menu.



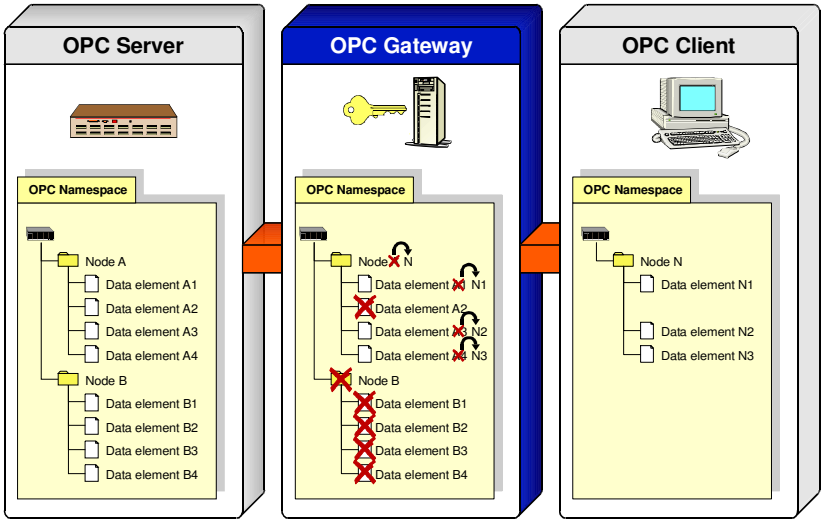
The configuration will be loaded automatically the next time when the *OPC Gateway Server* is started. To change this behavior, please refer to the chapter *General options*.

Congratulation. The configuration is completed and the server is now ready to be used.

System description

Introduction

The *OPC Gateway Server* is an OPC DA 2.05 Server but also an OPC DA 2.05 Client. The purpose of the gateway server is to make an interconnection between external OPC clients and OPC servers, whereby the OPC items in the namespace provided by the *OPC Gateway Server* are either only a subset of the namespace of the external server, or the gateway's namespace has a different organization with renamed elements or branches.



Why to use the OPC Gateway Server

Using the *OPC Gateway Server* maybe especially useful, when the possibilities of controlling the access right provided by COM/DCOM as the underlying technique for OPC are not sufficient. COM/DCOM does not allow to set individual access rights for each OPC item, hence a client which can access an OPC server always has access to all of its items. This may not always be desired and this is the main situation, where the *OPC Gateway Server* comes into the play.

Another, even though less important reason to use the *OPC Gateway Server* is when the namespace of the original server is not very well organized, and it is e.g. desired to change a flat, unorganized namespace into a hierarchical one.

The technique behind

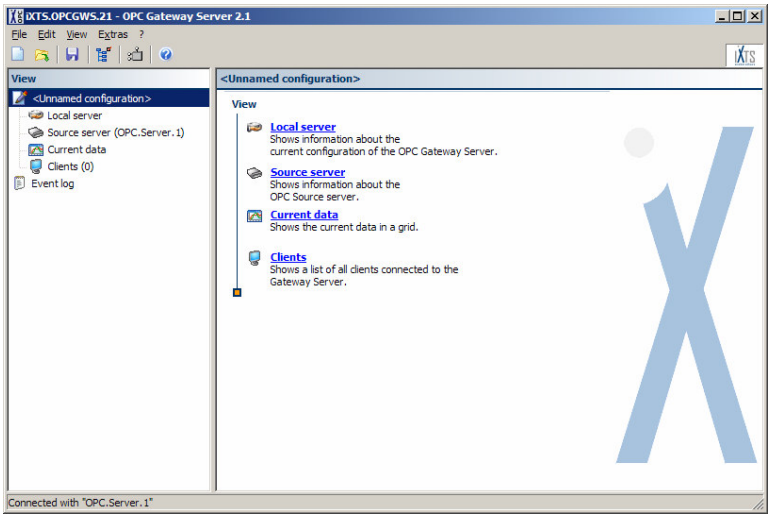
To make the data of an OPC source server available for an OPC client the *OPC Gateway Server* must act as a server for the external client and as client for the external server. In fact the *OPC Gateway Server* is an independent server. This makes it necessary that it must have its own **data cache** to store the data provided from the source server (also called the **remote server**). Any OPC client (also called **remote client**) connecting to the OPC Gateway Server receives its data from this data cache.

<table>
<tr><th>External</th><th colspan="3">OPC Gateway Server</th><th>External</th></tr>
<tr><td rowspan="3">Remote Server</td><td rowspan="3">Internal Client</td><td rowspan="3">Data cache</td><td>Internal server 1</td><td>Remote Client 1</td></tr>
<tr><td>Internal server 2</td><td>Remote Client 2</td></tr>
<tr><td>Internal server 3</td><td>Remote Client 3</td></tr>
</table>

User Interface

The main window

The main window of the *OPC Gateway Server* has a tree view on the left side with the title **View**, which allows selecting the information that should be displayed on the right side of the window.



The first node shows the file name of the current configuration and below this node four sub-nodes are available: **Local Server**, **Source server, Current data** and **Clients**. By clicking to one of these sub-nodes the respective status page will be shown.

The second top-level node is called Event log and clicking this node will switch to the event log where all error, warning or other information is logged. The amount of information shown here depends on the respective settings in the environment options. Please refer to the section *Setting the environment options* to learn more about this.

The File Menu

The following commands are available in the **File** menu:

Command	Description
New	Clear the configuration and start with a new one. Prompts the user for confirmation before continuing if OPC clients are still connected to the server.
Open	Load a previously saved configuration from disk. Prompts the user for confirmation before continuing if OPC clients are still connected to the server.
Save/Save as	Save the current configuration to a file.
Quit	Shut down the server and quit the application.

The Edit Menu

The following commands are available in the **Edit** menu:

Command	Description
Copy	Copy the selected entries of the event log to the clipboard. Only available when the event log is displayed and not empty.
Export event log	Exports the currently displayed event log to a file. **Note**: This command is intended to be used to save only the currently displayed events to a file. To save events automatically the auto-store function should be used. Please refer to the section *Setting the environment options*.
Clear current event log	Clears the currently displayed event log. This command has no effect to already saved event logs.
Reset overflow counters	Resets all overflow counters. **Note:** Overflow counters are used in conjunction with the *local buffering of data.*
Configure Server	Opens the configure server dialog. Please refer to section *Setting up the server* configuration for detailed information

The View Menu

The following commands are available in the **View** menu:

Command	Description
Local server	Show the state of the internal server
Source server	Show the state of the remote OPC server
Current data	Show a table with all published elements and their current value
Clients	Show the state of the connected remote client
Event log	Show the event log
Refresh	Forces a refresh of the currently shown information

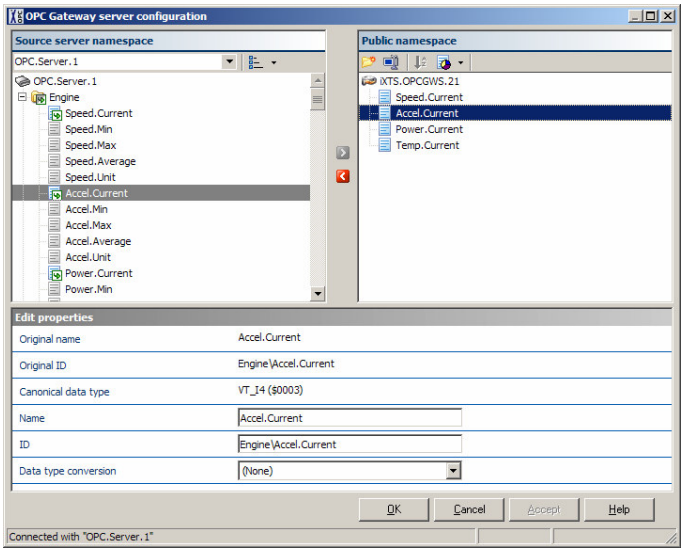
The Extras menu

The following commands are available in the **Extras** menu:

Command	Description
DCOM Configuration	Start the Microsoft DCOM configuration tool to set up access rights for the OPC environment
Close current event log file	Close the current event log file. This option is only useful in conjunction with the automatic event log saving to hard disk to finalize the currently opened file and start a new one.
Environment options	Open the environment option dialog to set startup options, event logging and default values. Please refer to section *Setting the environment options* for detailed information.

Setting up the server configuration

The server configuration can be changed using the OPC Gateway server configuration dialog, which can be opened using the **Configure Server** command in the **Edit** menu.



The configuration dialog is separated in three sections. On the upper left the source server and its namespace is shown. On the right you will see the namespace of the *OPC Gateway Server*, also called the *public* or *published namespace*. If an element of one the namespaces is selected and properties are available for this element, these properties will be shown in the lower part of the dialogue, where the property editor is located.

Source server namespace

The OPC source server can be selected using the drop-down-list in the upper left area. After selecting a source server, the *OPC Gateway Server* will try to start the source server and fetch its namespace to display it in the tree view below the list box. When the namespace is available single items or entire branches can be published either by using drag'n'drop, the  publish button between the two tree views or by using the **Publish** command from the pop-up menu.

Already published items are marked with the  icon, the publication can be removed by using the  unpublish button or the **Unpublish** command from the pop-up menu.

Below the tree view the property editor is located. This editor shows the properties, like e.g. the element name of ID, of the currently selected element.

Typically the namespace is shown as a hierarchical tree, but it can also be shown as a sorted or non-sorted list by using the  button.

Public namespace

The public namespace is the namespace offered by the *OPC Gateway Server* to connected clients. It can be configured by adding or deleting elements and branches from the source server namespace. Also additional branches can be created by using the  button or the **Create new node** command from the popup-menu. All elements and branches can be renamed by using the  button.

If the items in a branch and all sub-branches should be sorted alphabetically use the  button or the **Sort** command in the popup-menu.

To display the public namespace as a list, the  button can be used. Please note, that the namespace itself will remain hierarchical, it will only be displayed as a list. For this reason it is not possible to make any changes to the public name space while it is displayed this way. This option is only included as a preview of what a client will see, when he browses the namespace in flat mode. If you want to create a flat namespace use the hierarchical namespace with one single branch.

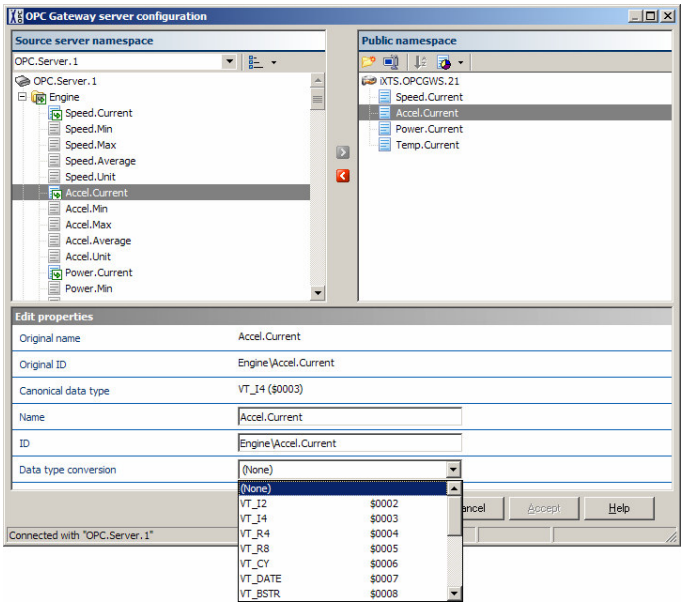
Property Editor

The properties of the currently selected element are shown in the lower section of the dialogue, in the property editor. Select an element in the published namespace to check or to change its properties here.

Changing canonical data types

As defined in the OPC specification OPC clients can request the data type of the data to be received from the server. If no specific data type is requested the data will be delivered in the default or canonical data type. By default the canonical data type of the published items is the same as of the original item on the remote server.

To change the canonical data type of the published items, the value of the property **data type conversion** in the property editor must be set to respective value. The *OPC Gateway Server* will then request the desired data type from the remote server using its data type conversion possibilities.



Note: Please be aware that the data type conversion is not for every combination of data types possible as not all values can be represented in any data type (e.g. string “Hello world” ➔ Integer: Conversion fails) and possible conversion errors are not always identifiable before real data is tried to be converted (e.g. string “2” ➔ Integer: Conversion ok)

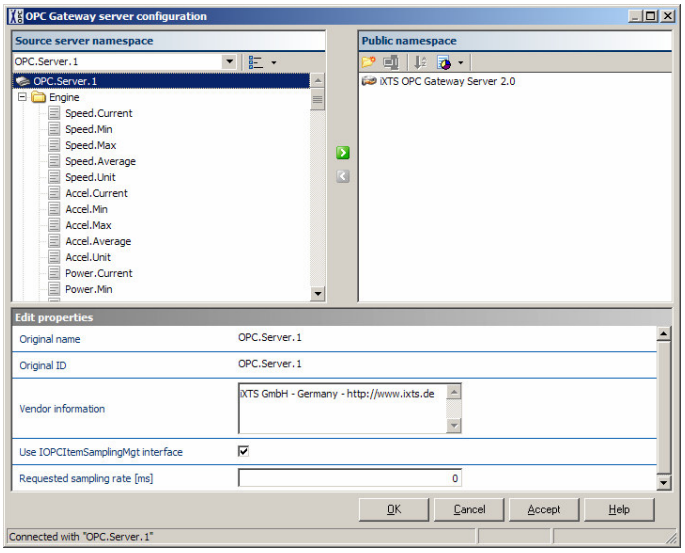
Local Data buffering

To prevent data loss when high speed data must be transferred to slower clients or via networks with temporarily high load the *OPC Gateway Server* can buffer the incoming data so that it can be forwarded when the client is again ready to receive it. This feature is especially necessary when the *IOPCItemSamplingMgt* interface of the remote server is used (please refer to section *using the IOPCItemSamplinghMgt interface* to learn more about using this interface).

When local buffering is enabled every incoming data will be stored in a FIFO (**F**irst **I**n **F**irst **O**ut) buffer and the OPC Gateway Server keeps track for every client which was the last transmitted data item and forwards all new data with the next callback.

Note: When local data buffering is used callbacks may contain more than one value for the same OPC item. Some OPC DA 2.05 clients may not be able to process such callbacks correctly. If you notice any misbehavior with your client set the **Forwarding strategy** in to *Only last value*. Using this option may lead again to data loss as not all data can be transferred to the client.

To enable and configure the local buffering select the top node of the published namespace and change the respective properties in the lower pane of the window.



The following properties are available to configure the local buffering:

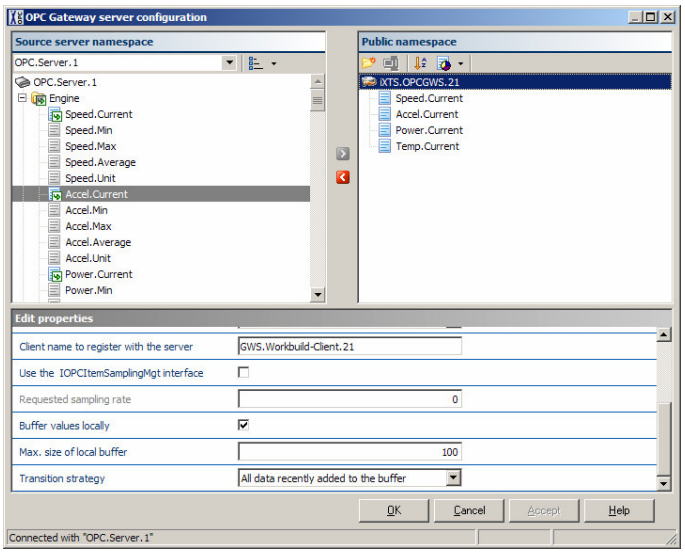
Property	Description
Enable local buffering	Enables the buffering of data within the *OPC Gateway Server*. Although this option is actually independent of using the *IOPCItemSamplingMgt* interface of the remote server, both options will normally be used together.
Maximal buffer size	Sets the maximum size of the local buffer (per item). Increase this value if you detect buffer overflows when transferring fast data to slower clients. Buffer overflows can be monitored using the overflow counters (see *add statistic data*).
Forwarding strategy	Determines how local buffered values should be transferred to the connected clients. **Only last value** A compatibility mode for older clients, where only the last value will be transferred. **All data recently added to the buffer** This option enables the forwarding of all buffered values to the client. This may lead to callbacks with more than one value per element.

Note: The default settings for this options can be set in the environment options dialog.

Using the *IOPCItemSamplingMgt* interface

The *OPC Gateway Server* can on the server side make use of the *IOPCItemSamplingMgt* interface as defined in the OPC DA 3.0 specification if the remote server supports it to allow higher internal sample rates on the server side without increasing the callback rate by the same amount. This goal can be achieved by enabling the server side buffering (which is independent of the *local buffering*) together with a higher sample rate on the remote server without changing the group sample rate. While the callbacks will still be triggered with the lower group sample rate they will then contain more than one value per OPC item. To learn more about the *IOPCItemSamplingMgt* please refer to the *OPC Data Access Custom Interface Specification* Version 3.00.

To make use of the *IOPCItemSamplingMgt* interface of the remote server select the top node of the source server namespace and change the respective properties in the lower pane of the window.



The following properties are available to use the *IOPCItemSamplingMgt* interface:

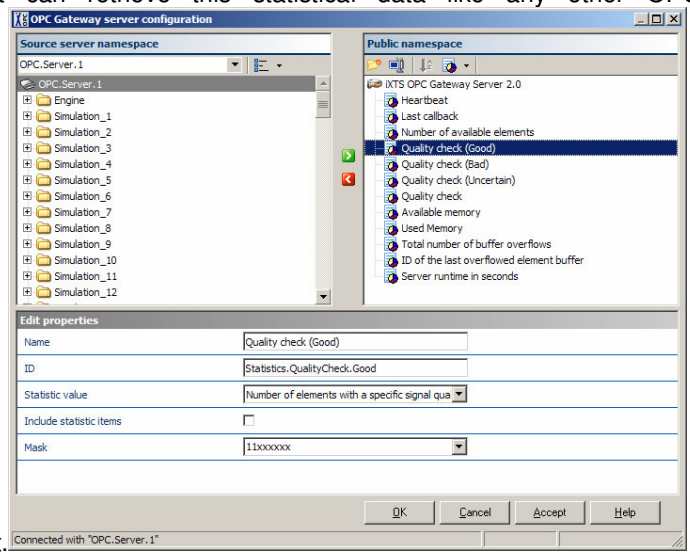
Property	Description
Use the IOPCItem-SamplingMgt interface	Enables or disables the data buffering on the remote server. Enabling data buffering allows a loss-free data transfer even at higher sample rates.
Requested sampling rate	Sets the interval sampling rate of the remote server. This settings takes effect for all elements – an individual setting for each element is not possible. **Remark:** A requested sampling rate of "0" will lead to the fastest sampling rate supported by the remote server.

The default settings for this options can be set in the environment options dialog.

Note: An entire implementation of the OPC DA 3.0 standard is not provided, i.e. the *OPC Gateway Server* itself does NOT provide this interface or any other OPC DA 3.0 functionality to the connected clients.

Add statistic data

The OPC Gateway Server provides so-called **statistical data** about the server itself and the system environment, which may be exposed in form of OPC elements in the published namespace. So any connected OPC client can retrieve this statistical data like any other OPC element.



Click on the arrow on the right side of the  button to add a statistical value as a new OPC element to the published namespace.

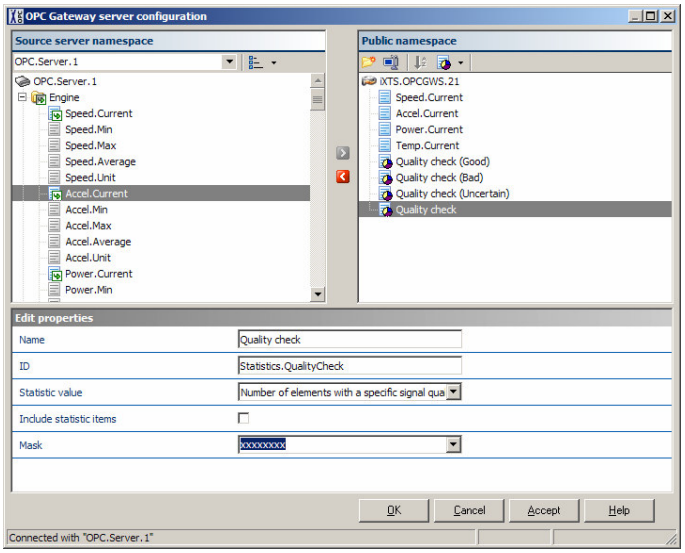
The following statistical elements are available:

Statistical element	Description
Heartbeat	A continuously incrementing number which allows a connected client to verify that the connection to the *OPC Gateway Server* is still established.
Time stamp of last callback	Contains the time stamp of the last callback received from the remote OPC server (i.e. time stamp of the last refresh)
Number of available elements	Contains the total number of published elements.
Number of elements with 'Good' quality	Contains the number of published elements with 'good' signal quality.
Number of elements with 'Bad' quality	Contains the number of published elements with 'bad' signal quality.
Number of elements with 'Uncertain' quality	Contains the number of published elements with 'uncertain' signal quality.
Number of elements with a specific signal quality	Contains the number of published elements with a signal quality corresponding to a user defined quality mask. . You find more information regarding quality masks in the section 'Setting the quality mask of statistical elements'.
Available memory [Bytes]	Contains the size of the available memory of the system where the *OPC Gateway Server* resides in bytes.
Used memory [%]	Contains a percentage value representing the used portion of the memory of the system where the *OPC Gateway Server* resides.

Total number of buffer overflows	Contains the total number of buffer overflows when *local buffering* is enabled
ID of the last overflowed element buffer	Contains the ID of the OPC element where the last buffer overflow was detected. The element can only be used when *local buffering* is enabled.
Server runtime in seconds	Contains the number of seconds since the local server within the *OPC Gateway Server* application has been started. On a system with a steady and not too high load this value should be identical to the value of the statistical element “Heartbeat“.

Note: By default statistical elements whose value is calculated by counting elements (e.g. depending on their quality) do ignore the statistical elements themselves. If the statistical elements should also be considered when counting elements please set the respective option in the properties of the statistic item.

Setting the quality mask of statistical elements



By using the statistical element ‘Number of elements with a specific signal quality’ the number of OPC elements whose quality bit mask correspond to a user defined bit mask can be determined. To do this first of all a **quality mask** need do be defined.

According to the OPC specification (http://www.opcfoundation.org) the signal quality of an OPC element contains 16 bits (= 2 Byte), whereby the upper byte (Bit 9 to 16) is reserved for vendor specific values and the lower byte (Bit 1 to 8) is used in a standardized manner. The OPC Gateway Server supports bit mask with up to 16 bits, but typically only the lower byte is used. Bit 7 and 8 contain the main quality and can contain the values **Good**, **Bad** and **Uncertain**. Bit 1 to 6 contain the sub-quality which may give some more specific information.

By providing a user-defined bit mask nearly any quality value can be monitored. A bit mask can contain the chars 0, 1 or x representing bits, which must be cleared, set or may be of any value.

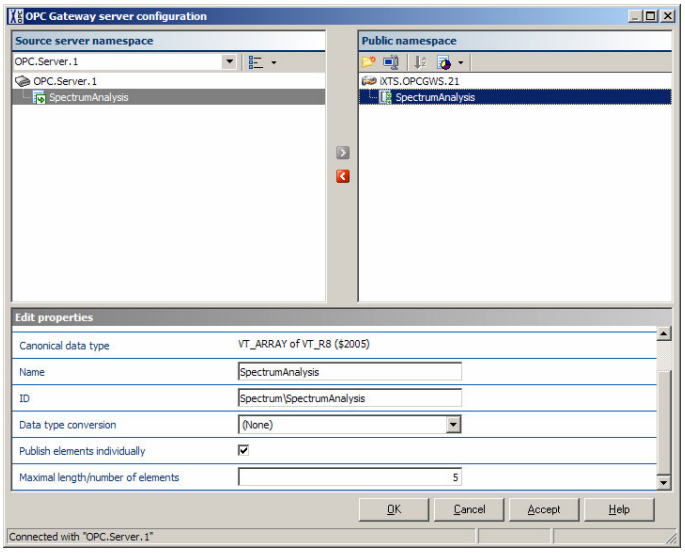
As an example the following bit masks may be used to filter the main quality:

Main quality	Mask
Good	11xxxxxx
Bad	00xxxxxx
Uncertain	01xxxxxx

So a statistical element with the provided bit mask for the 'Bad' quality would count also a quality like 00011010, because only bit 7 and 8 are relevant and must be 00.

Publish array elements individually

The *OPC Gateway Server* offers also the possibility to publish the elements of arrays (Datatype = VT_ARRAY) individually, which means that each array element will appear as individual OPC element in the published namespace.



When an OPC element of the type VT_Array is published, it will be displayed in the published namespace with the symbol. By checking the checkbox **Publish elements individually** the symbol will change to and after accepting the configuration a new branch with the same name and the suffix '[]' will be created. Within this branch an individual OPC element will be added for each array element starting with the index 0. The original array element will also remain in the published namespace.

Note: You can specify if the elements of new arrays are published individually by default on the page 'Default values' of the Environmental Options dialog.

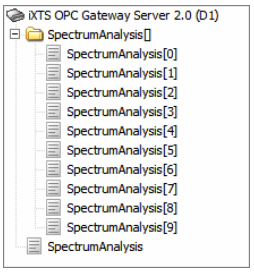
Maximal number of elements

Normally array elements have a fixed array length which can be determined by the *OPC Gateway Server* during the publishing process. But in some cases the length of the array data varies. In this case the **maximal number of elements** must be adjusted using the property editor.

Note: The *OPC Gateway Server* creates the stated number of array elements after closing the setup dialog. If the current array has fewer elements the *OPC Gateway Server* will return **NULL** values and **BAD (Out of service)** signal quality when one of the extra elements is requested by a client.

Namespace organization of published array elements

The branch containing published array elements will be organized by the *OPC Gateway Server* as follows:

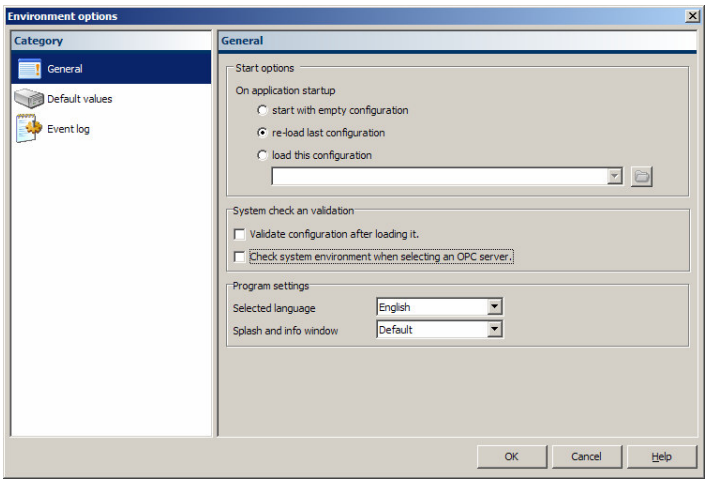


After setting up the server configuration click on **Accept** to keep the dialog open or on **OK** to close it.

Setting the environment options

By setting the environment options the overall behavior of the *OPC Gateway Server* can be adjusted to the personal needs. The settings are divided into three categories.

General options



The general options include the start options, which control the application behavior regarding the server configuration at startup. Available options are to **start with empty configuration**, which under normal circumstances doesn't make much sense. The default setting is **re-load last configuration**, which means that the application will try to re-load the last used configuration from the previous run. Maybe it is also desirable to define a fixed configuration file, which always will be opened without regarding what was opened before. In this case use the option **load this configuration**.

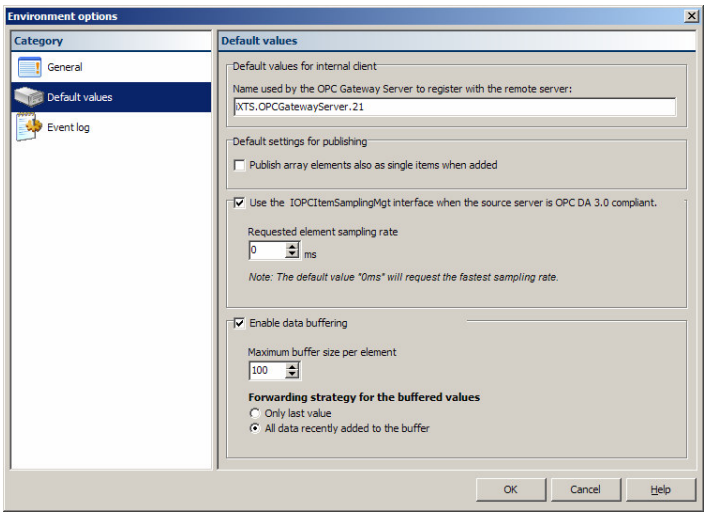
The option **Enable validation** controls the validation of the OPC items when a configuration is loaded. In general the validation makes sense to assure that the loaded configuration does correspond to the remote servers configuration. This allows immediate user information in case of a changed configuration of the remote server.

The option **Checking the system environment when selecting an OPC Server** enables or disables the environment check. Under normal circumstances it is recommended to enable the environment check. Please refer to the section *checking the system environment* to learn more about this feature.

By changing the language settings the language for the applications GUI can be set. Available languages are German and English.

Under certain circumstances you might encounter problems with the transparent window style, which is used for the splash screen on application startup and in the about dialog. If so try to change the option **Splash and info window** to fix the problems.

Default values



By default the *OPC Gateway Server* will register itself on the remote server with its EXE-Name but this default value can be changed by entering the desired name in the edit **Name used by the OPC Gateway Server to register with the remote server.**

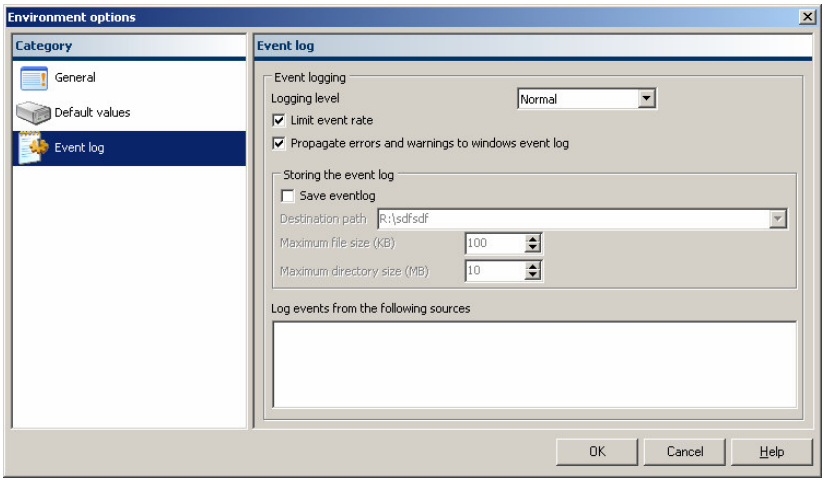
Check the option **Publish array elements also as single items when added**, if the elements of a newly published array element should be published individually. You will find more information regarding this feature in the section *Publish array elements individually*.

If additionally the *IOPCItemSamplingMgt* interface should be used be default if the remote server supports it check also the **Use IOPItemSamplingMgt interface** option and set the **Requested sampling rate** using the spin edit. More information about using the *IOPCItemSamplingMgt* interface can be found in the section *using the IOPCItemSamplingMgt interface* and in the *OPC Data Access Custom Interface Specification* Version 3.00.

Remark: A requested sampling rate of “0” will lead to the fastest sampling rate supported by the remote server.

If local data buffering should be enabled by default the option **Enable data buffering** must be checked. This will enable the spin-edit to set the **Maximum buffer size per element** and the radio buttons to define the forwarding strategy. Please refer to section *local data buffering* to learn more about local data buffering.

Event log



The event log is used to log all relevant information, including errors and warnings, which occur during the applications lifetime. Depending on the situation a more or less communicative system may be desirable. This can be controlled by setting the **logging level**. Six different levels are available: *Nothing, Very little, Little, Normal, Extended* and *All*. The default value is normal which means that all important information is logged without flooding the log with irrelevant details. This setting should normally not be changed, except for diagnostic purposes. See section *Logging* to learn more about this.

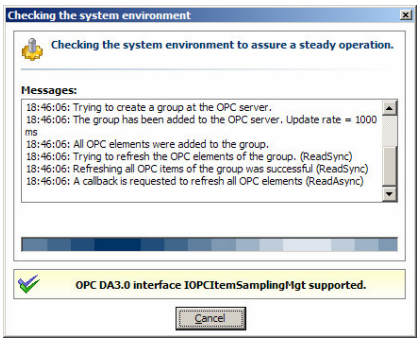
The **Limit event rate** checkbox is by default checked, which means that in case that an excessive amount of events is created by the system (e.g. due to a malfunction or due to a high OPC load in conjunction with the logging level set to *All*) the rate is limited by dropping events. This option is included to prevent the system from “hanging” due to a overload caused by consecutive repaint operations. This option should only be unchecked if under certain circumstances the dropping of events is not desired. This may lead to the described consequences.

The meaning of **Propagate errors and warnings to windows event log** is quite self-explaining. This option is checked by default.

If desired the logged events can also be stored on hard disk by checking the **Save event log** checkbox. In this case a directory for the log files must be selected and a maximum file and directory size must be given. When the maximum file size is reached the current file is closed and a new file is created. When the maximum directory size is reached the oldest log file will be deleted automatically.

Another possibility to limit the number of logged events, especially when the logging level is set to *All* is given by the option **Log events from the following sources**. By un-checking some of the listed event sources all events from these sources will be dropped. The list is dynamically created, so at the first start up, the list will be empty. When the first message from a new source is received this sender will be added to the list. By default all senders are enabled and changing this setting should only be necessary for diagnostic purposes. See section *Logging* to learn more about how to use this feature.

Checking the system environment



Every time when connecting to an OPC Server the *OPC Gateway Server* will perform a system environment check to assure a steady operation of the application. During this environment check some selected methods of the offered OPC interfaces are called to ensure their correct execution and the correct setting of the DCOM rights.

Under normal circumstances the environment check should always remain enabled to assure the steady operation of the *OPC Gateway Server*. If for any reason the environment check should be disabled remove the checkmark of the respective checkbox in the general options section of the environment option dialog.

Licensing and Activation

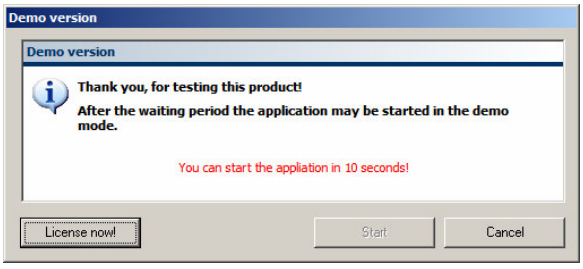
General

There are three possibilities how the *OPC Gateway Server* can be licensed:

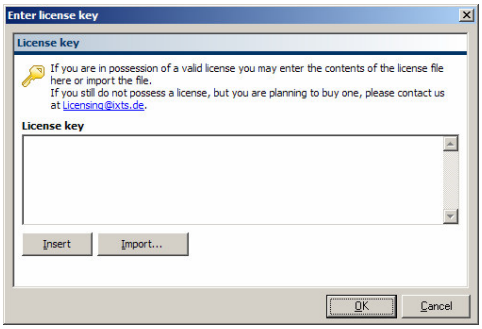
- **Demo version**
  Without licensing the *OPC Gateway Server* is running in the demo mode, which offers nearly the entire functionality with some limitations and for a maximum run time of one hour. To learn more about licensing please refer to the section *Licensing*.
- **License with product activation**
  This kind of license requires explicit product activation for the *OPC Gateway Server*. The activation enables the software to be executed on the current system. The software will run in the demo mode while no activation has been done. Learn more about activation in the section *Product activation*.
- **Open license**
  An open license has no restriction regarding functionality and is not associated to a certain system. Please take care of the regulations in the End User License Agreement (EULA).

Licensing

If the *OPC Gateway Server* is still not licensed this can be done immediately after starting the software. If the software is already running you may open the license dialog via the menu item *Help* | *Enter license key*.



After clicking on **License now** the following dialog will appear:



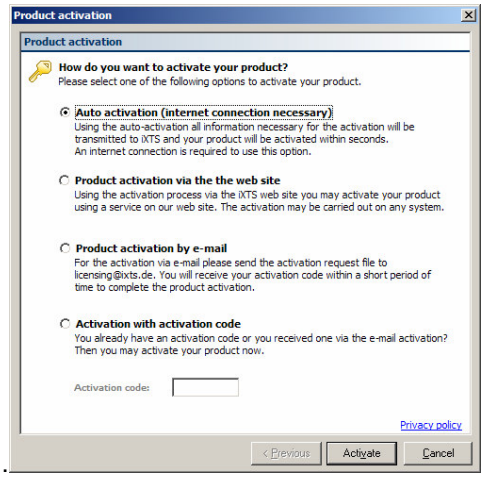
The license key may be copied from the Windows clipboard into the respective edit control or a license file (*.lic) can be imported.

If you still do not have your valid license file, please contact us via e-mail at Licensing@ixts.de.

Depending on the license file product activation may be necessary. Please refer to the section *Product activation* to learn more about this procedure..

Product activation

Depending on the type of license you are using a product activation may be necessary. After activating the *OPC Gateway Servers* program execution in non-demo-mode will be enabled on the activated system.



There are three different ways to activate the *OPC Gateway Server*.

The easiest and quickest way is the **"auto activation"** via internet. If you have access to the internet from the system where the *OPC Gateway Server* resides all necessary information may be exchanged automatically, so the *OPC Gateway Server* will activate itself without further user interaction and the entire functionality of the system is instantly available.

*Please note that for the automatic activation a **direct** connection to the internet is necessary. The use of a proxy server is not supported.*

The product **activation using our web site** is the first choice if the system where the *OPC Gateway Server* resides does not have a direct connection to the internet. To activate the *OPC Gateway Server* using the web site a activation request file must be created on the target system which the will be transferred to the iXTS web site. Within a few seconds an activation code will be created and the activation can be completed. The activation service is available under http://www.ixts.de/activation.

Another possibility is the **product activation via e-mail** which may also be an alternative when no direct connection to the internet is available on the target system. To use this way the activation request file is also necessary, but instead of uploading it via the website you just send it to licensing@ixts.de and you will receive your activation code within a short period of time.

If you already have an activation code or if you received one by e-mail or from the web site use the option **Activate with activation code** to enter the code in the edit field. If the activation code is correct you gain full and unlimited access to all functions of the *OPC Gateway Server*.

Diagnostics

Logging

The *OPC Gateway Server* generates a variety of so-called events, which contain information about the current program state, occurred error or other details. These events are always logged within the application in the event-log and may also be automatically written to the hard disk.. If a problem with the gateway server occurs then the log files can be extremely valuable for troubleshooting. By default the automatic saving to hard disk is *disabled* and must be enabled when necessary. Also by default the application logs not very much information, i.e. that the *logging level* is set to normal. Both settings can be changed in the *Event log* tab of the *Environment options* dialog.

The higher the log level, the more information is recorded. However, the performance of the *OPC Gateway Server* may decrease at higher log levels. The recommended logging level is *Normal*. In most cases the *Extended* logging level should be sufficient to troubleshoot the problem. If not the *All* logging level will record all information available within the server.

In general, the server logs all errors and other information of immediate importance to the user at the *Little*, or *Very little* logging level, all warnings and other information of not immediate but still significant importance to the user at the N*ormal* logging level. Information of moderate importance to the user will be logged at the *Extended* logging level, and further information especially for the support personnel will be recorded if the logging level is set to *All*.

Especially in higher logging levels a lot of events may be produced so the server load may increase significantly. To avoid this effect, the *OPC Gateway Server* allows restricting which software classes are allowed to send events to the event log. To configure this feature a deeper understanding of the software architecture is necessary, so under normal circumstances all classes should remain enabled as event sources.