

# **OPCAELINK**

**For distributing alarms from OPC  
Alarm&Event Servers  
to Wonderware Distributed Alarm System**

**User Manual  
Ver 1.x Rev 1.3  
PR 115 10**

**KLINKMANN AUTOMATION  
P.O. Box 38  
FIN-00371 Helsinki Finland  
Tel. int. + 358 9 5404940  
Fax int. + 358 9 5413541  
[www.klinkmann.com](http://www.klinkmann.com)**

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# OPCAELINK

## Overview

The **OPCAELINK** is a Microsoft Windows 32-bit application program for distributing alarms from OPC Alarm&Event (A&E) Servers to Wonderware Distributed Alarm System, primarily to Wonderware InTouch 7.11 Alarm Consumers. The OPCAELINK consists of two parts:

- **OPC A&E Client** part, providing OPC A&E interface with OPC A&E Servers.
- **Wonderware Alarm Provider** part, providing COM interface to Wonderware Distributed Alarm System; this part is implemented by Wonderware Distributed Alarm Toolkit.

The OPCAELink combines OPC A&E Client and Wonderware Alarm Provider functionality in one application and is designed to be a gateway between OPC A&E Servers and Wonderware Distributed Alarm System. OPCAELINK can work on same Microsoft Windows platforms (NT, 2000, XP) where Wonderware Distributed Alarm System can work.

## OPCAELINK Interfaces

**OPC** (OLE for Process Control) is an open interface standard to provide data from a data source and communicate the data to any client application in a common standard way. The OPC is based on Microsoft OLE, COM and DCOM technologies and enables simple and standardised data interchange between the industrial or office sector and the production sector. From general point of view many aspects of OPC are similar to DDE, but main difference is in the implementation by using Microsoft's COM (Component Object Model) technology. It enables fast exchange with process automation data and OPC open interface allows access to data from OPC Server in same standard way from OPC client applications supplied by different developers.

The **OPC Alarms and Events** (A&E) interface is used between OPC A&E Clients and OPC A&E Servers for monitoring and acknowledging of alarms and events. For more information on the basics of OPC Alarms and Events, please refer to the **OPC Alarms and Events Custom Interface Standard** maintained by **OPC Foundation**, the latest version is 1.1 (Release Candidate 1) dated June 2002.

The **Wonderware Distributed Alarm Toolkit** provides a high-level COM interface that does not require detailed handling or understanding of the low-level details of the client/server communication protocol used by the Wonderware alarm subsystem. The Wonderware Distributed Alarm Toolkit supports the development of two types of Alarm components: **Alarm Providers** (implemented in OPCAELink) and **Alarm Consumers**. Alarm Providers are components that generate and report alarms. Generally, an Alarm Provider monitors the status of one or more important items in the system, and reports information about alarms. Specifically, it does the following:

- Tells the Alarm subsystem about the onset of *alarm conditions*.

- Tells the Alarm subsystem when an alarm condition *returns to normal*.
- Receives *user requests* regarding alarms, for example, *acknowledgements* of alarm occurrences.
- Tells the Alarm subsystem when an acknowledgment is *accepted*.

## Installing the OPCAELINK

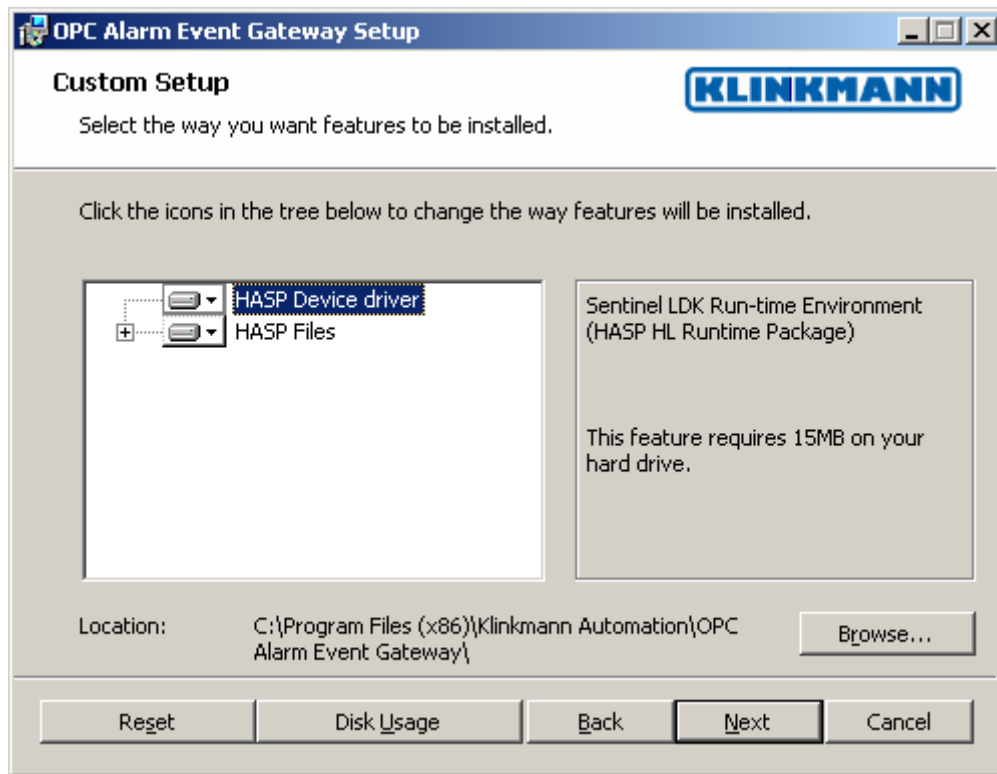
### Installing the product

The OPCAELink installation package is supplied as a Microsoft Installer file PR115\_10\_xxx.msi, where xxx is the current (latest) version of the OPCAELink.

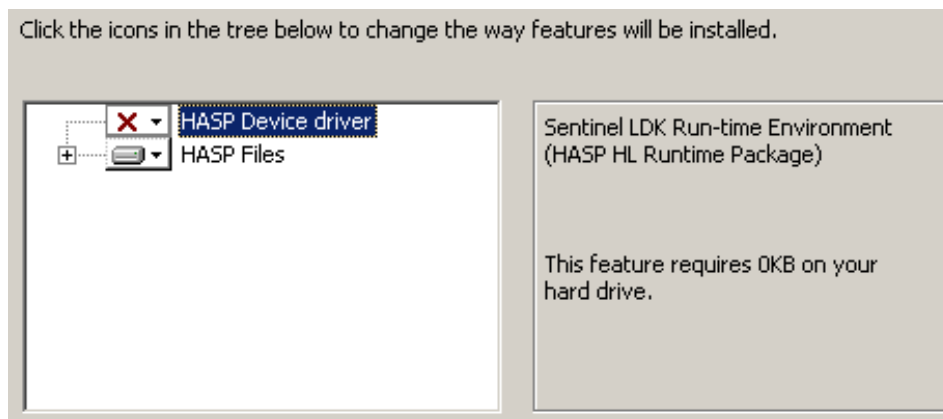
To install the OPCAELink, run the PR115\_10\_xxx.msi and proceed as directed by the OPCAELink Setup Wizard. The installation is simple and straightforward, only it is important to select the correct protection (**HASP key** or **software license**) in “Custom Setup” dialog.

The HASP key or software license key is needed for full time running of OPCAELink. The **HASP key** is an USB key (dongle) to be installed into PC USB port and needs the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) to be installed and running – see details in “Licensing by using HASP HL key” section below. The **software license key** is a 16-character alphanumeric “computer-dependent” string, provided after purchasing the OPCAELink (for more information, see “Software license key” section below. Without HASP key installed or software license key entered, the OPCAELink will run one hour in demo mode. After purchasing the OPCAELink, the appropriate HASP key or software license key is provided and no re-installation of OPCAELink is needed.

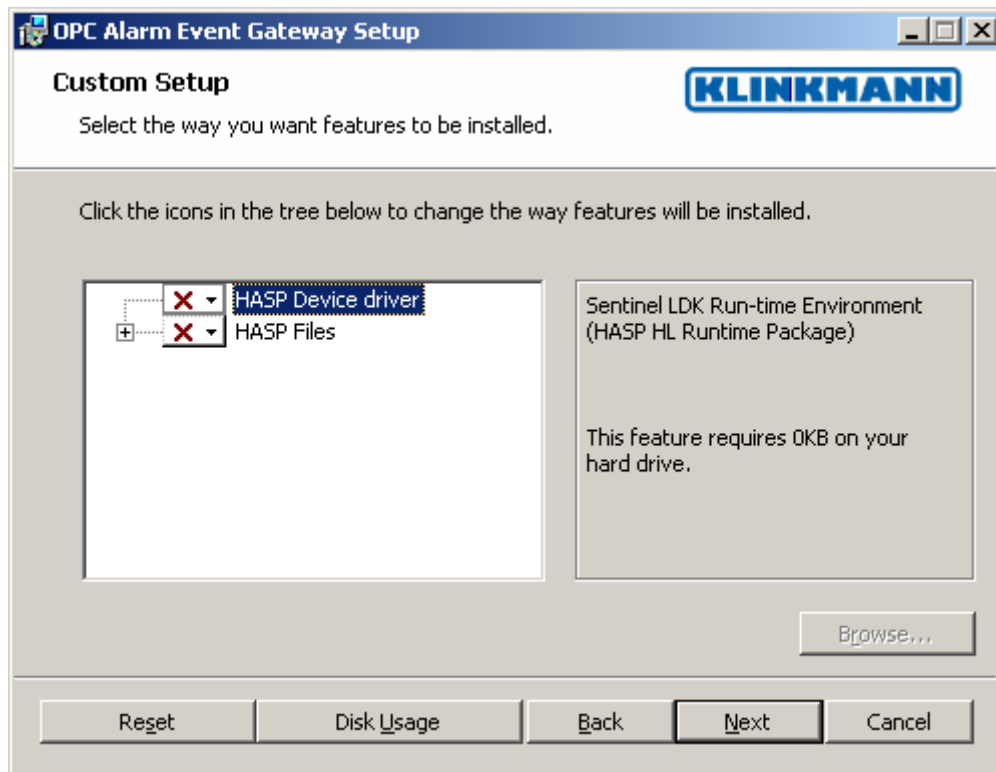
In case “HASP Device driver” and “HASP files” **are selected** then HASP USB key will be supported and both HASP-key and software license will be available (files needed for HASP USB key will be installed):



**Note:** In case the SafeNet Sentinel LDK Run-time Environment (HASP HL Runtime Package) is already installed on your computer (separately or by some other software) then it can be disabled:



In case “HASP Device driver” and “HASP files” **are not not selected** then HASP USB key will not be supported and only the **software license** will be available (files needed for HASP USB key will not be installed):



When installation is finished, the subdirectory specified as a folder where to install the OPCAELink files will contain the following files:

- |                            |   |
|----------------------------|---|
| <b>OPCAELink.exe</b>       | The OPCAELink Program. This is a Microsoft Windows 32-bit application program.  |
| <b>OPCAELink.chm</b>       | The OPCAELink Help file.  |
| <b>OPCAELink.tlb</b>       | The OPCAELink Type Library file.  |
| <b>hasp_windows_44.dll</b> | Dynamic Link Library installed only if “HASP Files” is selected during the installation in “Custom Setup” dialog.   |
| <b>haspdinst.exe</b>       | Sentinel LDK Run-time Environment Installer (HASP HL Runtime Package), copied to CL Server/Client folder only if “HASP Device driver” is selected during the installation in “Custom Setup” dialog. |
| <b>license.rtf</b>         | Klinkmann Automation software license file.   |
| <b>regtlibv12.exe</b>      | Utility for .tlb file registration.   |

In case the “HASP Device driver” is selected during the installation in “Custom Setup” dialog, the Sentinel LDK Run-time Environment (HASP HL Runtime Package) is installed during the OPCAELink installation (and will be uninstalled during the OPCAELink uninstallation). The presence of Sentinel LDK Run-time Environment can be checked

after the OPCAELink installation by looking-up in Control Panel / Administrative Tools Services – the Service “Sentinel Local License Manager” must be started.

To **uninstall** the OPCAELink, start Control Panel, select “Uninstall a program” (“Add/Remove Programs” on XP/2003) and select the “OPC Alarm Event Gateway” from the list of available software products. Click on “Uninstall” (“Add/Remove...” on XP/2003) and proceed as directed by the Uninstall Wizard.

## Licensing by using HASP HL key

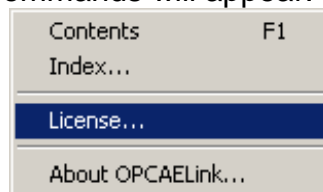
The following should be done to enable the licensing by HASP HL key:

- The “HASP Device driver” is selected during the OPCAELink installation in “Custom Setup” dialog – that causes correspondingly haspdinst.exe and hasp\_windows\_4442.dll files are copied to OPCAELink folder and Sentinel LDK Run-time Environment (HASP HL Runtime Package) is installed and started, enabling the OPCAELink can detect the HASP HL USB dongle;
- insert the received HASP HL key into USB port, and **wait** until “Installing device driver software” message disappears and “Device driver software installed successfully” message appears;
- start OPCAELink and check - if “Software key or HASP HL key not found!” message does not appear then it means everything is done correctly and OPCAELink runs in full mode with licensing by HASP HL key enabled.

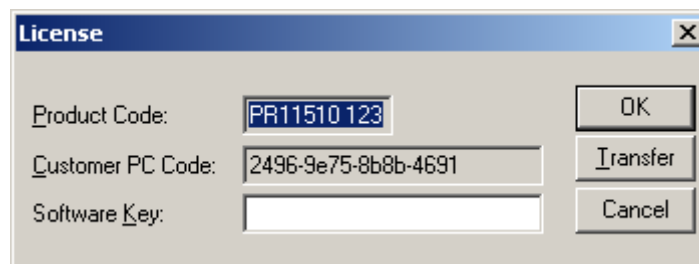
## Software license key

OPCAELink supports the “computer dependent” **software licensing**. The following steps are required to enable it:

1) Start OPCAELink, click on "Help" menu item (also short-cut Alt+H can be used) and pop-up menu with "Help" menu commands will appear:

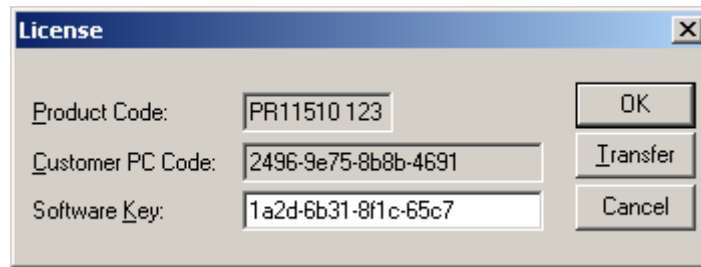


Select “License” and “License” dialog will appear:



2) Here the “Customer PC Code” is “computer-dependent” string generated by OPCAELink and it is unique for this computer. Write it down or Copy/Paste to e-mail when ordering the OPCAELink.

3) After purchasing the OPCAELink, you will get the software license key - 16-character alphanumeric string. Open the "License" dialog again and Copy/Paste it to "Software Key" field:



4) Click OK and restart OPCAELink. OPCAELink software license now is enabled.

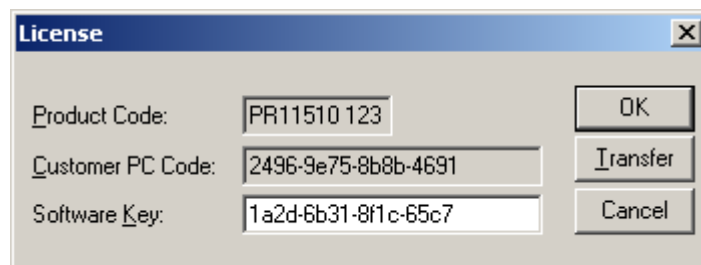
Note – the "Software Key" string is saved to MS Windows registry to enable it is automatically detected at OPCAELink next start-up.

### Transferring the software license to other computer

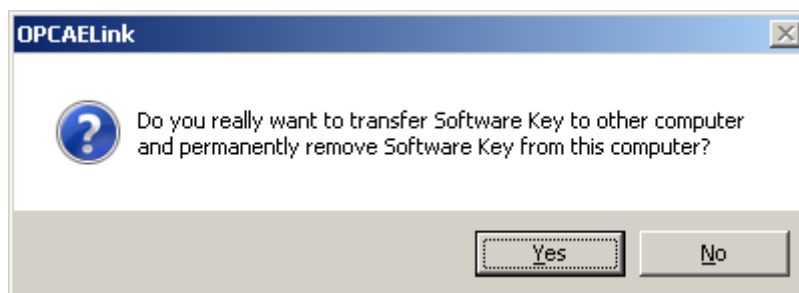
The transfer of Software License Key might be needed in very rare situations when it is necessary to move Klinkmann software to other computer (or operation system change is planned for same computer). Such transfer PERMANENTLY removes the Software License Key, so be very careful when deciding to use this option.

The following steps are required to transfer the Software License Key:

- 1) Select Help/License from main menu and click the "Transfer" button on "License" dialog:

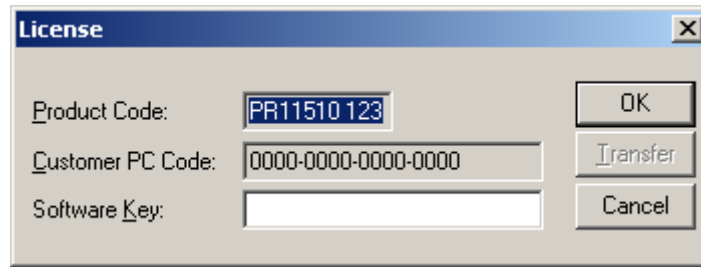


- 2) Confirm the transfer of Software License Key by clicking on Yes button:

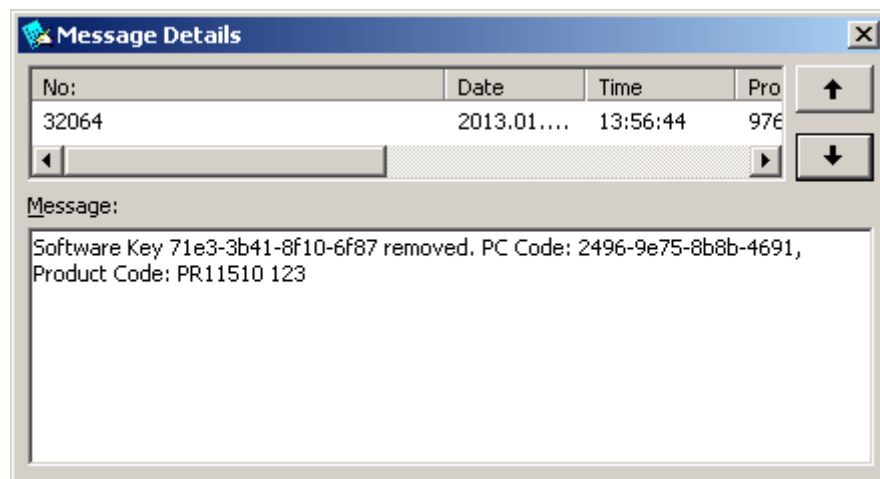




The “License” dialog now will contain the empty “Customer PC Code” and “Software Key” fields:



- 3) Take the screenshot from Archestra SMC Logger window containing the “Software License Key removal message”, like below:



or take the string with “Software License Key removal message” directly from Archestra SMC Logger, like following:

**Software Key 71e3-3b41-8f10-6f87 removed. PC Code: 2496-9e75-8b8b-4691, Product Code: PR11510 123**

- 4) Provide the obtained “Software License Key removal message” screenshot or string together with new “Customer PC Code” when applying for new Software License Key without purchasing the new license (in situations when it is necessary to move Klinkmann software to other computer or operation system change is planned).

#### Note!

Without providing the “Software License Key removal message” screenshot or string, the new Software License Key will not be assigned.

## OPCAELINK Main Window

OPCAELINK Main Window is divided into two panes: the left pane is used to browse and connect to local or remote OPC A&E Servers as well as to monitor the OPC A&E Server

connection state. The right pane is used to display received events and additional information about each of them:

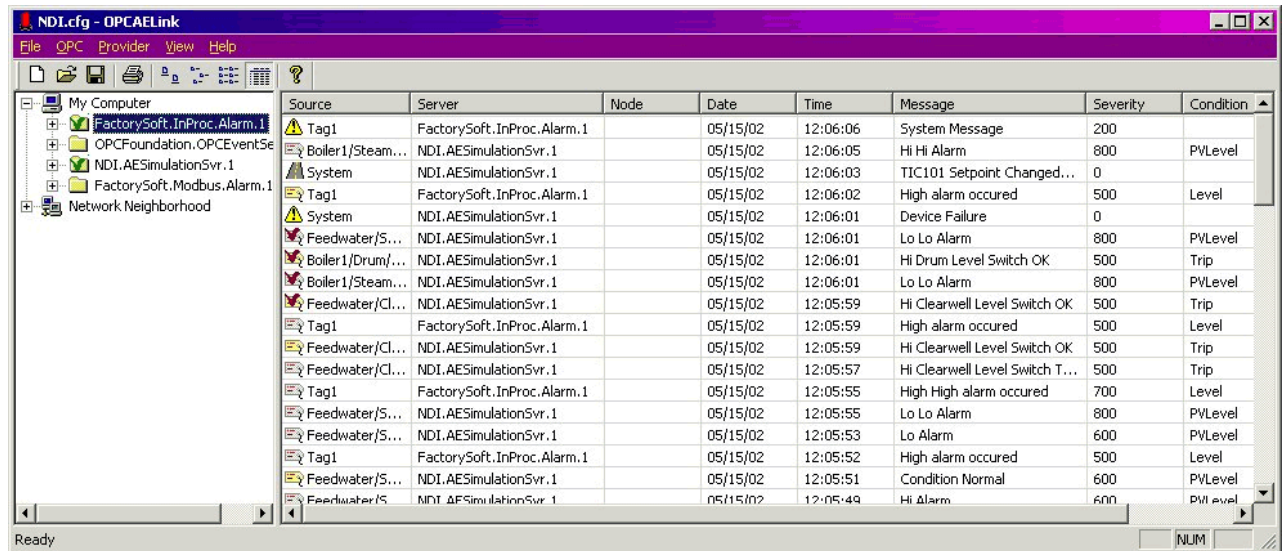


Figure 1. The OPCAELink main window

Contents of the active pane can be printed. If problems will occur when using OPCAELINK, message boxes will be displayed or messages will be logged to the Wonderware Logger.

## OPCAELINK OPC A&E Client Part

### Connection to OPC A&E Servers

Connection to some existing OPC A&E Server is quite simple: just browse necessary OPC A&E Server on OPCAELINK Main Window left pane, select the Server and by using right button of mouse, choose the context menu item *"/Connect"* or menu item *"/OPC/Connect"*. The successful connection will be indicated by green check mark and received events displayed on OPCAELINK Main Window. OPCAELink is supporting simultaneous connection to several OPC A&E Servers.

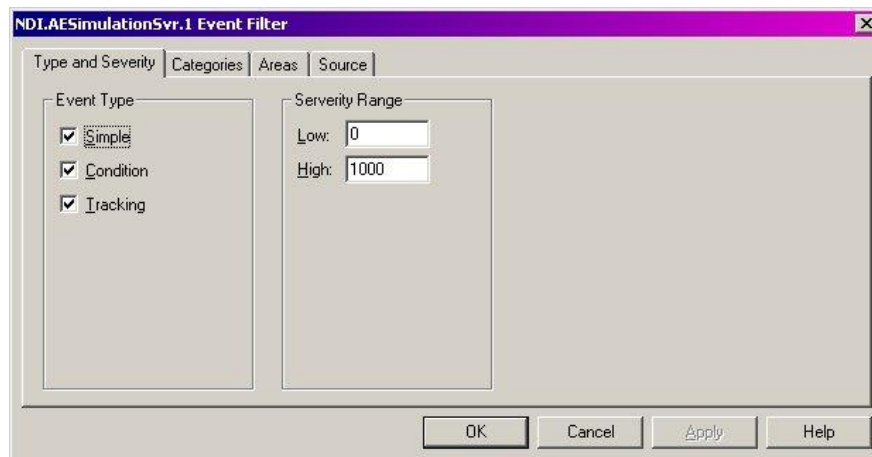
**Note!** For successful connection to remote OPC A&E Server, the additional configuration of DCOM (Distributed COM) both for server and client PCs can be required.

### Filtering of OPC events

For more selective event reporting to WW Alarm System, the filtering of alarms and events can be used. To filter the received events, select some connected OPC A&E Server and choose the context menu item *"/Filter..."* or menu item *"/OPC/Filter..."*. As required by OPC standard, filtering is available by following parameters (properties): Type and Severity, Categories, Area and Source. By default, filtering is disabled. If filtering is used then all filtering settings will be logically merged together.

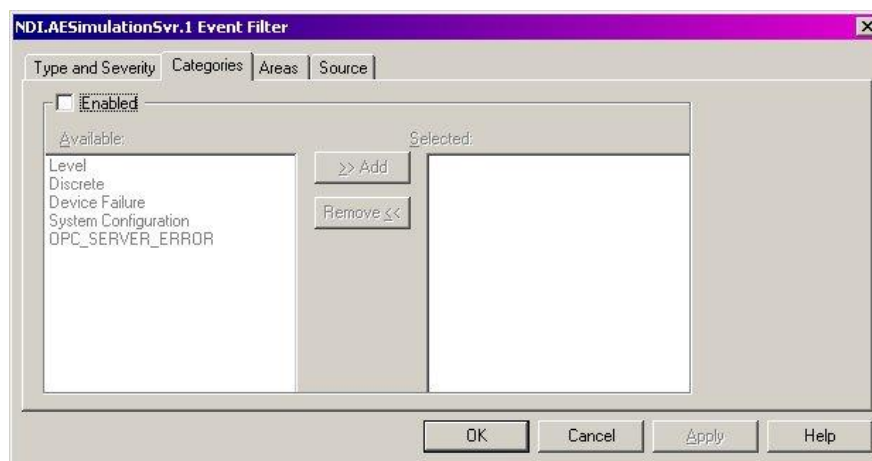
The short description of each filtering properties page follows.

The first filtering properties page allows to configure filtering by **Event Type** and **Severity Range**:



**Figure 2.** The “Type and Severity” filtering properties page

By default, **all** Event Types are selected and Severity Range is set from **0** to **1000**. The next **Categories** page can be used to filter events by specific OPC A&E Server categories:

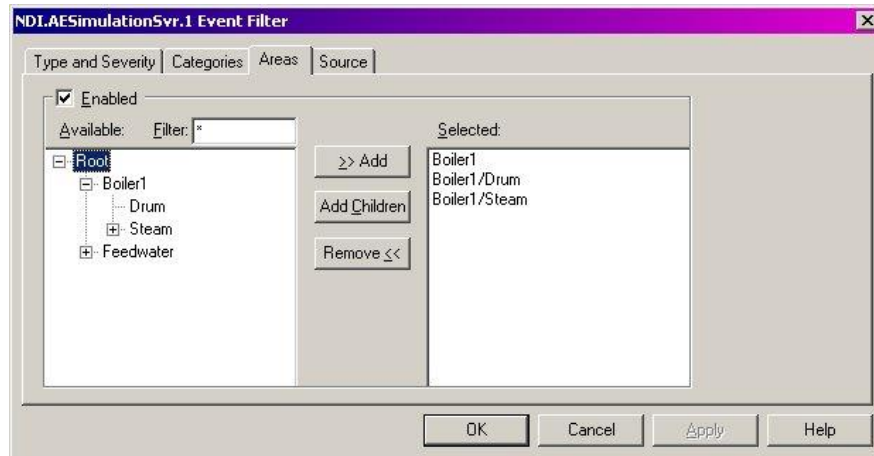


**Figure 3.** The “Categories” filtering properties page

To activate event filtering by Categories, it must be **Enabled** and then, by selecting one or more **Available** categories from the list and pressing **Add** button, added to **Selected** categories. To edit the list of **Selected** categories, **Add** new **Available** categories from the list or **Remove Selected** categories. To disable filtering (i.e. receive events of all categories), uncheck the **Enabled** checkbox.

Available Categories are OPC A&E Server specific and by default filtering by Categories is not enabled.

To activate filtering by **Areas**, it must be **Enabled**:

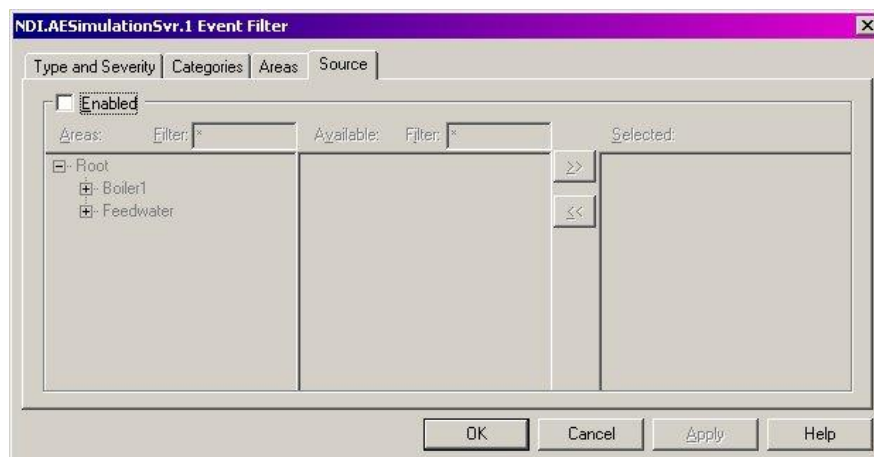


**Figure 4.** The “Areas” filtering properties page

**Available** Areas can be **Selected** in two ways: 1) by pressing **Add** and adding the selected **Available** area or 2) by pressing the **Add Children** button to add selected **Available** area with all branches to the list. To **Remove** areas from the **Selected** list, select the areas and use the corresponding button. For easy browsing of **Available** root area, the browsing **Filter** is built-in.

By default, the Area filtering is not enabled and in Figure 4 the example of filtering for specific Server is shown.

The last **Source** page is used to filter events from specific OPC A&E Server tags:



**Figure 5.** The “Source” filtering properties page

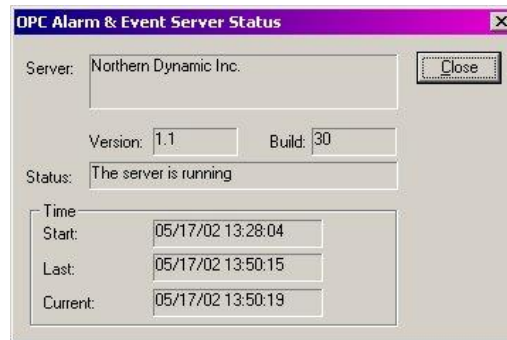
Configuring of area filtering is like in previous pages: at first, filtering must be **Enabled**, then specific tag browsed in the tree of available **Areas** and in the list of **Available** tags for the selected area. To receive events from **Selected** tags, select tags from the list of **Available** tags and click on the **>>** (add) button. For removing the tag from the list of **Selected** tags, use the **<<** (remove) button. For easy browsing the area and tags, the browsing filters are built-in.

By default the Source filtering is not enabled.

After all connections to OPC A&E Servers are made and filters are set-up, the settings can be saved into a configuration file for later restoring at OPCAELink next starting-up.

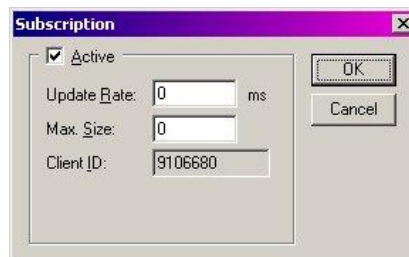
## OPC A&E Server Status and Subscription

To obtain the **Status** of the selected OPC A&E Server, choose the context menu item “/Status...” or menu item “/OPC/Status...”:



**Figure 6.** The “OPC Alarm & Event Server Status” dialog box

The **Subscription** settings can be selected by context menu item “/Subscription...” or by menu item “/OPC/Subscription...” and are used to determine how OPC A&E Server will inform about events:



**Figure 7.** The “Subscription” dialog box

The **Update Rate** is amount of time that Server buffers events before sending to client. If the **Update Rate** is set to 0, the Server sends event as soon as they are generated. The **Max. Size** setting is used to set-up the number of buffered events before sending to client.

## Displaying of OPC events

The right pane of OPCAELink Main Window is used to display alarms and events received from all connected OPC A&E Servers, with additional information supplied. Following information is displayed for each OPC alarm/event (see also *Figure 1. The OPCAELink main window*):

- 1) type of alarm/event as icon:
  - a) light yellow tag - active condition event,

- b) light grey tag - inactive condition event,
- c) exclamation mark - simple event,
- g) highway - tracking event.

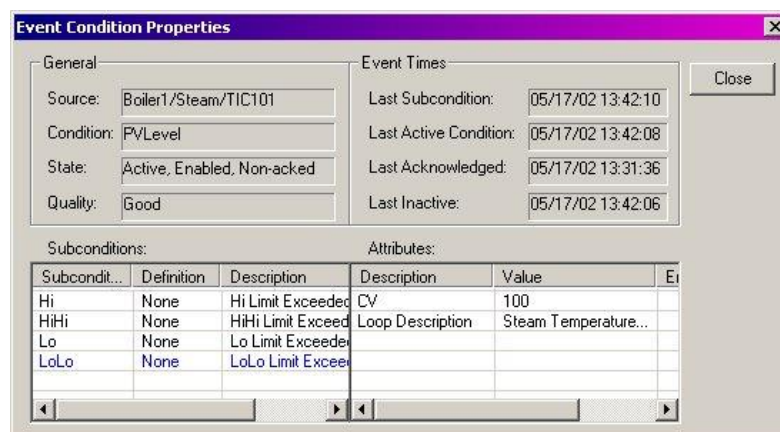
Condition events can be signed by check mark to indicate the acknowledged event.

- 2) Source.
- 3) OPC A&E Server name.
- 4) Node name for remote OPC A&E Server.
- 5) Date when alarm/event occurred.
- 6) Time when alarm/event occurred.
- 7) OPC A&E Server specific Message of the alarm/event.
- 8) Severity (priority) of the received alarm/event.
- 9\*) alarm Condition.
- 10\*) Subcondition for condition events.

\* – Empty for simple and tracking events.

Only the last 200 alarms/events are displayed in the list.

More complete information about the current state of the selected tag can be get by choosing the context menu item *" /Properties..."* or "Alt + Enter" hotkey. The "Event Condition Properties" dialog box is showing the additional information about condition events: General information (source name, condition name, state and quality of the item), Event Times (last date and time for subconditions, conditions last active state, acknowledgment, inactive state), lists of event conditions and OPC A&E Server specific event Attributes. If event is active, the currently active subcondition will be selected.



**Figure 8.** The "Event Condition Properties" dialog box

An empty dialog box will be displayed if simple event or tracking event was selected.

By selecting the context menu item *" /Clear"*, the content of the right pane can be cleared, but by selecting the context menu item *" /Pause"* – paused. When event displaying is paused, last 200 events will be saved for later displaying.

## Disconnecting from OPC A&E Server

To disconnect from the selected A&E Server, use the context menu item *"/Disconnect"* or menu item *"/OPC/Disconnect"*. When menu item *"/File/New"* is selected, the OPCAELink disconnects from all OPC A&E Servers and will be unregistered as Alarm provider.

When OPC A&E Server is shutting down while OPCAELink is connected, user will be informed about that:

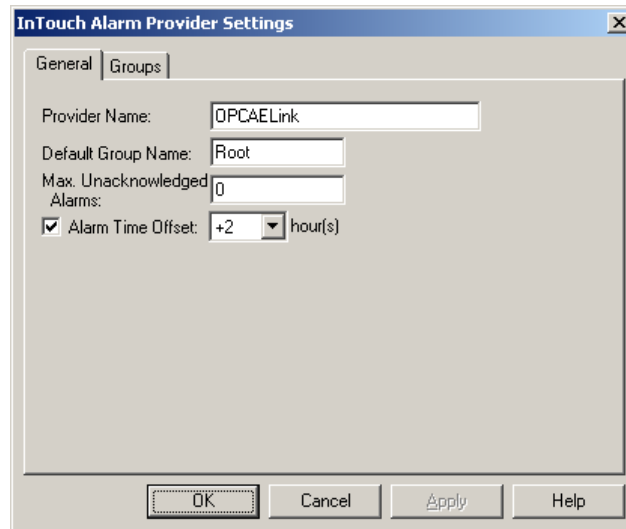


**Figure 10.** Shutting down of OPC A&E Server message box



## OPCAELINK Wonderware Alarm Provider Part

To configure the OPCAELink Alarm Provider part, select the menu item "Provider/Settings..." and "General" properties page will appear:



**Figure 11.** The "General" properties page

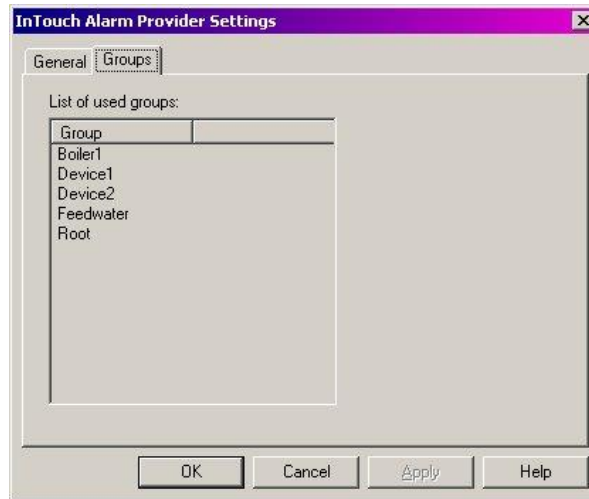
Enter the Alarm **Provider Name** (default name is "OPCAELink") and enter the **Default Group Name** ("Root" as default) in case OPC A&E Server is not supporting hierarchical item browsing or has root items.

In case necessary, enter non-zero value in **Max. Unacknowledged Alarms** field – the number of unacknowledged alarms before the alarm source will be disabled (default = 0 (this function disabled), max. value = 1000).

In case necessary, check the **Alarm Time Offset** and select the offset (in hours) needed to be added/subtracted to/from the raw date/time provided by OPC A&E Server. This feature can be useful in case OPC A&E Server provides the UTC date/time and it is necessary to provide alarms with local date/time (by assuming the Daylight Saving Time is already included in date/time provided by OPC A&E Server).

The entering of group names is not necessary because OPCAELink scans the area names of connected OPC A&E Server and registers them as Wonderware Alarm System group names. All group names are displayed on the "Groups" properties page and will be needed when configuring the Window Maker's Distributed Alarm Display:





**Figure 12.** The "Groups" properties page

When setting of both Alarm Provider parameters is done, the OPCAELink can be registered or unregistered manually as Wonderware Alarm provider by choosing menu items *"/Provider/Register"*, *"/Provider/Unregister"* and saved into a configuration file.

## Saving and restoring the OPCAELINK settings

When connections to necessary OPC A&E Servers is made and Wonderware Alarm Provider is configured, the list of all connected OPC A&E Servers, subscription and filter settings for each OPC A&E Server, Provider Name and Default Group Name can be saved in a configuration file (having filename extension .cfg). At next OPCAELink start-up and by selecting the necessary configuration file, the connection to all OPC A&E Servers, restoring of filter settings and registering as WW Alarm provider will be done automatically.

## Using OPCAELINK with InTouch

At first, before first start-up of OPCAELink, be sure the Wonderware InTouch 7.11 which is supporting Distributed Alarm System and latest patches of Alarm System are installed on your computer.

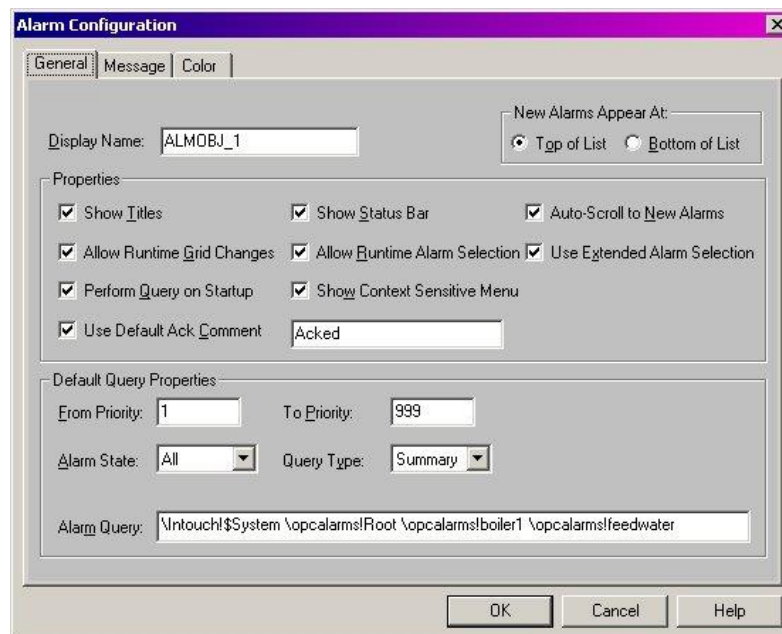
To receive alarms/events from OPCAELink, the Distributed Alarm Display (Alarm Consumer) must be included in InTouch application. For successful alarm receiving, as minimum, it is necessary to enter Alarm Provider name and group names in the format:

**"\Provider\_Name!Group\_Name".**

For example, if OPCAELink Provider Name is set as "opcalarms", Default Group Name is "Root" and group names are "Boiler1", "Feedwater", the following expression must be added to existing ones in the Alarm Configuration, General page, **Alarm Query** editbox:

`"\opcalarms!root \opcalarms!boiler1 \opcalarms!feedwater"`

Other Distributed Alarm Display settings can be set if necessary:



**Figure 13.** An example of Wonderware Distributed Alarm Display configuration

Because more than one OPC A&E Server can be started on same PC, the "Name" of alarm in the Wonderware Distributed Alarm Display includes node and server name in the following format:

**"\\Node\_name\\Server\_name!Tagname".**

OPC A&E Servers are not supplying alarm values and limits, therefore if columns "Value" are "Limit" are selected for displaying, all time the records "N/A" (not available) will be displayed. Remember, that numbering of priorities (severities) for OPC A&E Servers and Wonderware Alarm System is different (from highest to lowest):

- a) OPC A&E Servers: 1000 ... 1;
- b) WW Alarm System: 1 ... 999.

OPCAELink is converting OPC alarm priority level to Wonderware Alarm System level.

Simple OPC events will be displayed if **Query Type** "Historical" is selected.

## Troubleshooting

Problems when using OPCAELink will be indicated as message boxes or records in the WonderwareLogger.

Possible problems and reasons:

1. No OPC A&E Servers available in the tree:
  - a) OPC A&E servers not present or not correctly installed;

- 
- b) Not all OPC system components (i.e., opcenum.exe) are installed or registered.
2. Connection to local or remote OPC A&E Server is impossible:
- a) Not all OPC system DLLs are installed or registered;
  - b) Configuring of DCOM is not properly done if accessing remote OPC A&E Server;
  - c) Remote node is not accessible.
3. Errors when registering Alarm Provider:
- a) InTouch 7.11 and/or latest patches not installed;
  - b) Provider name is already registered.
4. No events received by Alarm Consumer:
- a) OPCAELink Alarm Provider is not registered;
  - b) For Alarm Consumer (Distributed Alarm Display) and Provider (OPCAELink) different provider and/or group names are set;
  - c) Not well matched OPC A&E Server filter settings are set-up;
  - d) Distributed Alarm Display is not properly configured.

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KLINKMANN AUTOMATION  
OPCAELINK  
Revision History

|          |         |  |
|----------|---------|--|
| Jul 2002 | Rev 1.0 | First Release  |
| Nov 2012 | Rev 1.1 | “Installing the OPCAELINK” section modified.   |
| Jan 2013 | Rev 1.2 | “Installing the OPCAELINK” section modified,<br>“Licensing by using HASP HL key” and “Software<br>license key” sub-sections added. |
| May 2013 | Rev 1.3 | “OPCAELINK Wonderware Alarm Provider Part” section<br>modified   |