**Kepware Products for Windows 95™ ,98™, 2000™, NT™, And XP™**

# KepserverEx Client Connectivity Guide

## For Clear Controls ClearView

**KTSM-00023**

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32 Bit KepserverEx Connectivity Guide

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# Table of Contents

**INTRODUCTION TO KEPSERVEREX ..... 1**

**ACCESSING KEPSERVEREX ..... 1**

USING KEPSERVEREX DRIVERS ..... 2

**CLEARCONTROLS CLEARVIEW AS AN OPC CLIENT ..... 3**

CONNECTING THE CLEARVIEW OPC CLIENT ..... 3
CREATE A NEW PROJECT ..... 4
*Create a Connection to the OPC Server ..... 5*
CREATE A SCREEN ..... 8
*Create a Screen to Display OPC Tag Data ..... 8*
*View the Data ..... 10*
*Starting the ClearView Server ..... 11*
RUN THE PROJECT ..... 12

**USING KEPWARE'S OPC QUICK CLIENT ..... 13**

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# Introduction to KepserverEx

KepserverEx is a 32 bit windows application that provides a means of bringing data and information from a wide range of industrial devices and systems into client applications on your windows PC. KepserverEx falls under the category of a "Server" application. It is very common to hear the term "client/server application" in use across many software disciplines and business segments. In the industrial market, it has usually come to mean the sharing of manufacturing or production data between a variety of applications ranging from human machine interface software and data historians, to large MES and ERP applications.

Regardless of the business segment served, client/server applications have one thing in common: a standardized method of sharing data. In the industrial segment, many client/server technologies have been developed over the last ten years. Initially, some of these technologies were proprietary. In many cases these proprietary client/server architectures were in wide use but remained unavailable to third party applications. Early in the development of windows, Microsoft provided a generic client/server technology called DDE or Dynamic Data Exchange. DDE did provide a basic architecture that would allow many windows applications from a wide range of vendors to share data, but there was one problem. DDE was not designed for the industrial market. It lacked much of the speed and robustness desired in an industrial setting. However, this did not stop DDE from becoming a dominant client/server architecture, largely due to its availability in most windows applications. In time, variations on Microsoft's DDE were developed by some of the leading vendors in the market. These variations addressed some of the speed and reliability issues of DDE but many people in the industrial segment agreed that a better system needed to be developed.

With the advent of 32 bit Operating Systems, and the use of Ethernet to provide communications between devices, there was a need for quicker and cleaner data transfer between software applications. This is where OPC saw its birth into the industry.

OPC (OLE for Process and Control) servers provide a standardized method of allowing multiple industrial applications to share data in a quick and robust manner. The OPC server provided in this package has been designed to meet the demanding requirements found in the industrial environment.

This OPC server has been designed as a two-part program. The primary component provides all of the OPC and DDE connectivity as well as the user interface functions. The second part is comprised of plug-in communications drivers. This two-part design allows you to add multiple communications options to your SCADA application while utilizing a single OPC server product thus reducing your learning curve as your project grows.

OPC technology reflects the move from closed proprietary solutions to open architectures that provide more cost-effective solutions based on established standards.

# Accessing KepserverEx

A Windows based client application must be used to view data from the KepserverEx application. In this section we will cover the basics of connecting a number of common OPC clients to KepserverEx. While we cannot possibly cover every client application that exists, we believe that after reviewing this document you should be able to deal with most client applications.

The intention of this section is to show connectivity to KepserverEx. It is assumed that you have already either configured your KepserverEx application by selecting the appropriate driver and settings or you have run the Simulator demo (Simdemo.opf) which is included with KepserverEx. For simplicity, the Simdemo project will be used for all examples contained in this section.

Before beginning any of the examples, start the KepserverEx application by selecting it from your Start Menu or from its desktop icon. Once the server is loaded, use the File|Open command to

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load the “Simdemo” project. The KepserverEx application is always active once you have opened an existing project or configured at least one channel and device in a new project. After you have selected a project, in this case the Simdemo project, KepserverEx will automatically load this project when an OPC client application invokes KepserverEx’s OPC server component.

Users have always had the ability to create what we refer to as “user defined tags” in their KepserverEx application. Prior to OPC, defined tags gave a DDE application designer the ability to create a label for device data. Assume register 1000 contained the value of parts made, without defined tags a DDE application would have directly accessed register 1000. Using defined tags a label can be created like “PartsMade”. Now the DDE application could access the data via this new label, removing the machine level knowledge from the client application and keeping it at the server level where it belongs. This label, while useful for DDE is a necessity for OPC clients. For OPC clients, defined tags take on a greater role. Like the DDE example, defined tags allow you to create labels for your device data and keep the configuration of those tags in the server. OPC clients have a major advantage over DDE clients. OPC clients can browse the defined tags you create in your KepserverEx application, which allows you to simply point and click on a tag to add it to your OPC client project.

*OPC Tag Browsing allows you to see a list of the defined tags you have created in your KepserverEx application, directly within your OPC client application.*

For more information on defined tags see the “Designing a Project” section of the KepserverEx help file, which can be accessed from the Help/Contents menu selection of the KepserverEx application.

## Using KepserverEx Drivers

Part of the innovative design of Kepware’s OPC/DDE Server Technology is the separation of the Hardware Protocol Driver from the Server Technology. This separation allows the user to use one or more drivers in the server at the same time. Each driver has its own help file which provides information on devices supported, communications parameters, cabling, addressing, and error messages.

The driver help file should contain all of the information you will need to connect your device to the PC so that we can talk to it. If you do not connect to the device be sure to check the error messages and look up their meaning in the help file.


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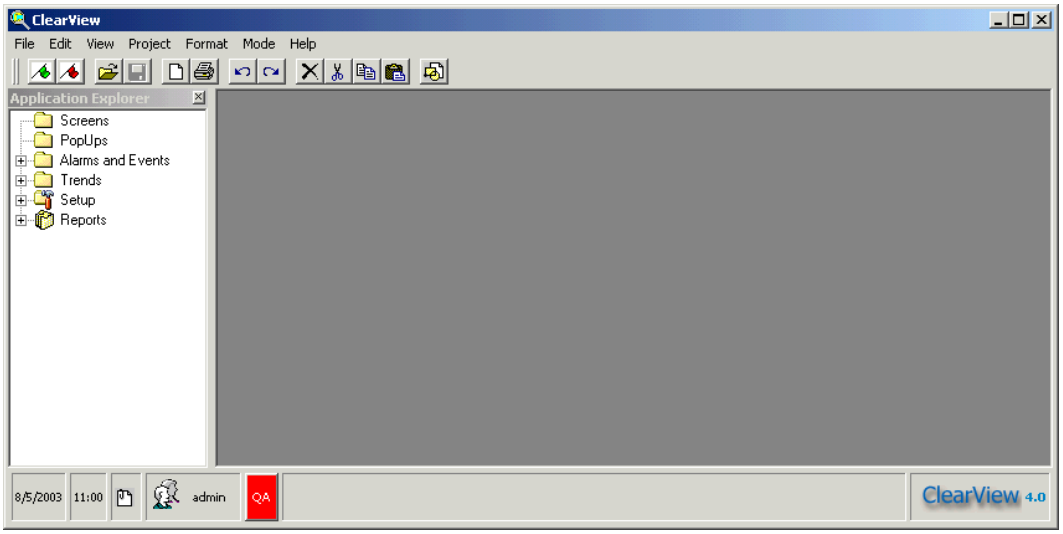
# ClearControls ClearView as an OPC Client

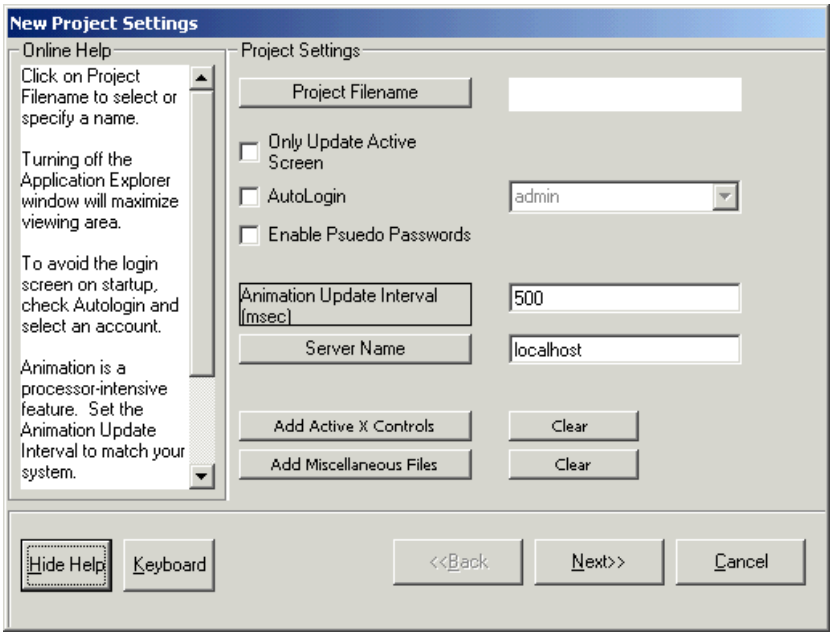
## Connecting the ClearView OPC Client

ClearControls ClearView as an OPC Client is one of the many HMIs that can be used to connect to KepserverEx. The following steps will show you how to create an OPC connection to the server from ClearView.

From Programs in the Start menu select the Clearview Client shortcut.




Once it is open click on File|New Project to create a new ClearView project.

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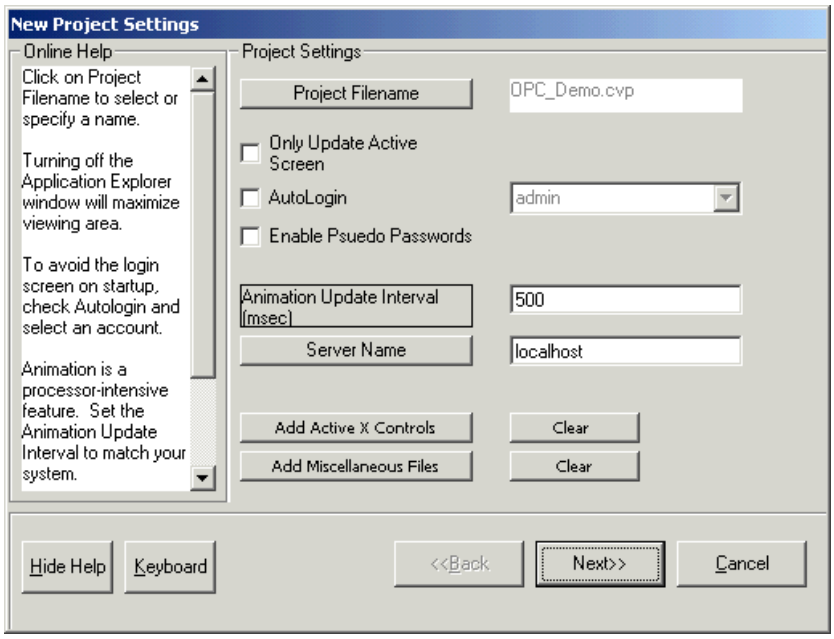
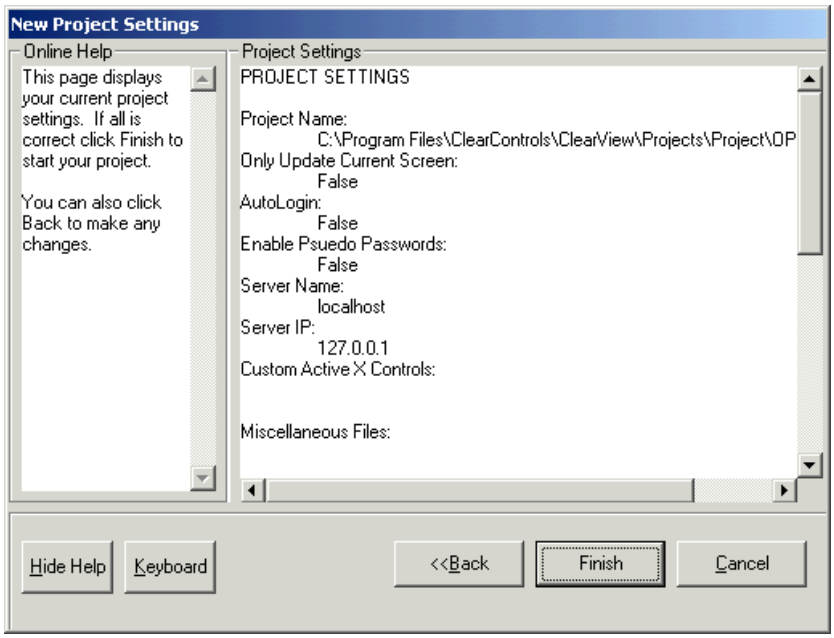
# Create a New Project

You will now see a New Project Settings window. Click on the Project Filename button to open the file Save As window. Enter a name for your project in the File name field. We named our project "OPC_Demo"




At this point for the purpose of this demonstration you can accept the rest of the settings in their defaults. To do this Click the Next button until you reach the project summary.




Click the "Finish" button to close the New Project Settings window.

Next you will get a prompt to add a screen in the Add Screen dialog box.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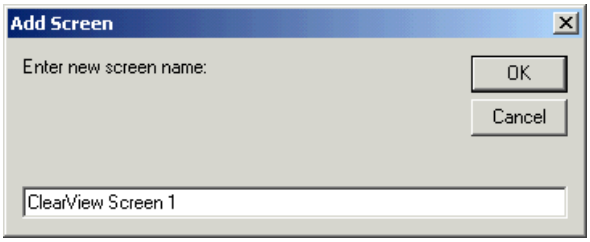
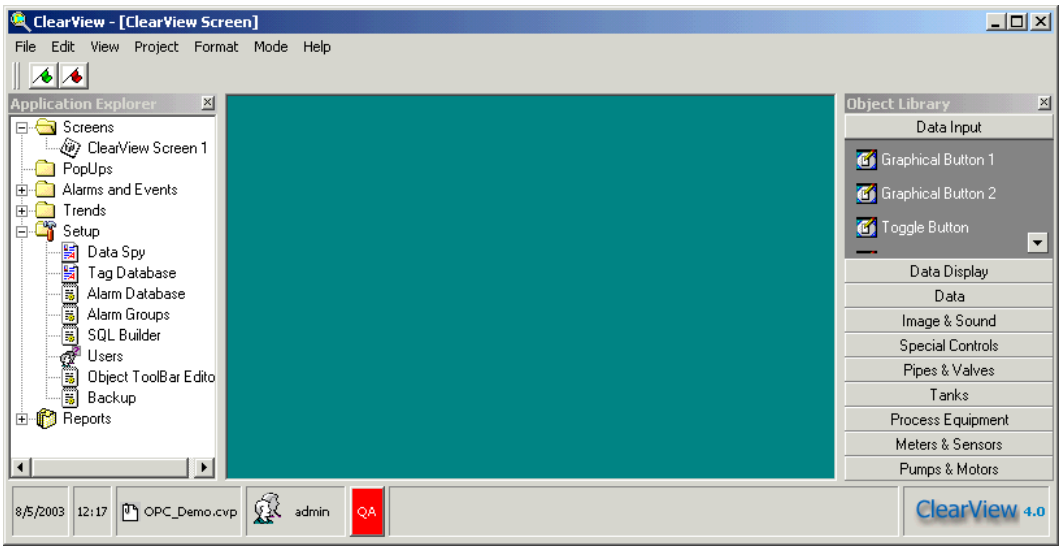



For the intents of this example you can accept the default screen name of “ClearView Screen 1” by clicking the OK button

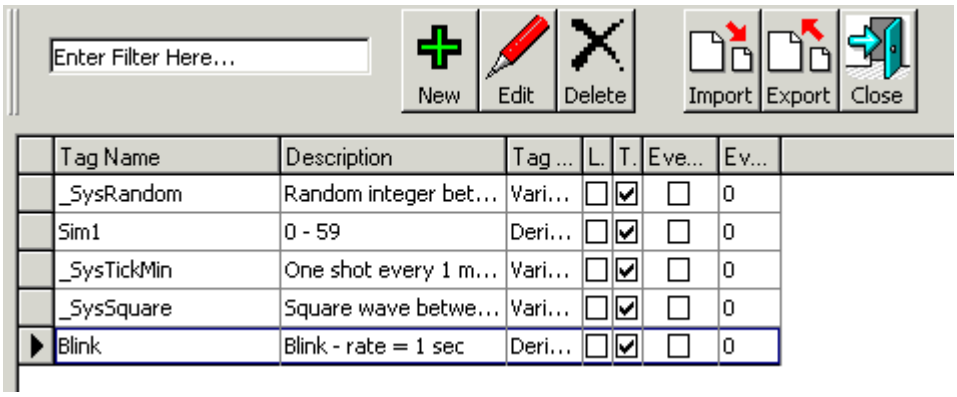
For more information on the other parameters in the New Project Settings window see the ClearView manual.

## Create a Connection to the OPC Server

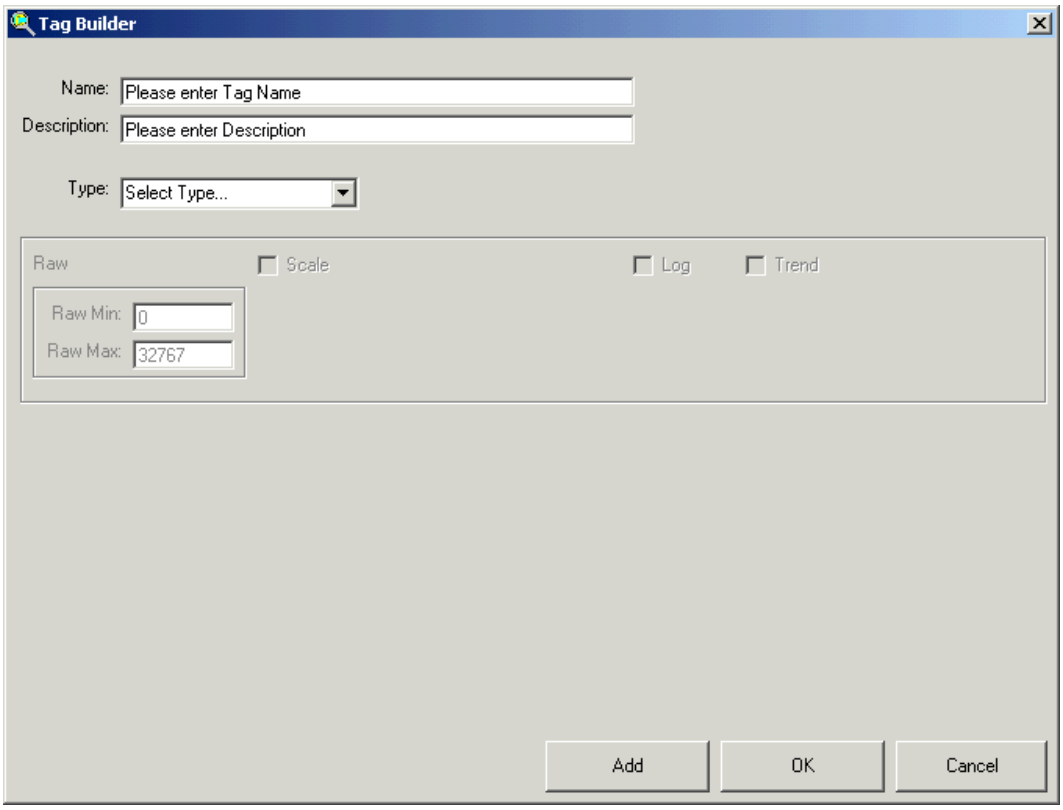
Now that the new project has been created it is time to connect to KepserverEx and add items to the project. Expand the Setup folder in the Application Explorer window.




In the Setup folder, double click on Tag Database to open the Tag Database utility.

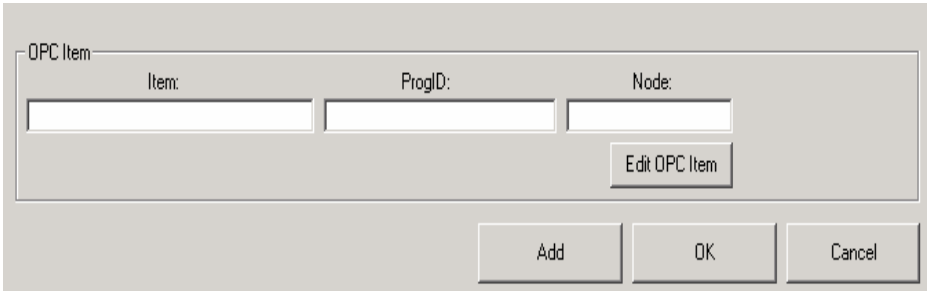



Click the “New” button to create a new tag. A Tag Builder window will appear.

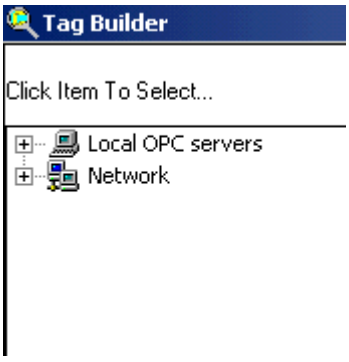



Enter a tag name in the Name field. In the Description field, type specified description (e.g. Test OPC tag). Lastly, in the "Type" field, use the drop down menu to select the item type of OPC Tag.

Once you select the OPC Tag type you well get the OPC Item section in the Tag Builder. Click on the "Edit OPC Item" button to browse for and select and tag from KepserverEx.




In the browser explorer expand Local OPC Servers. ClearView will automatically browse your system for available OPC server programs.





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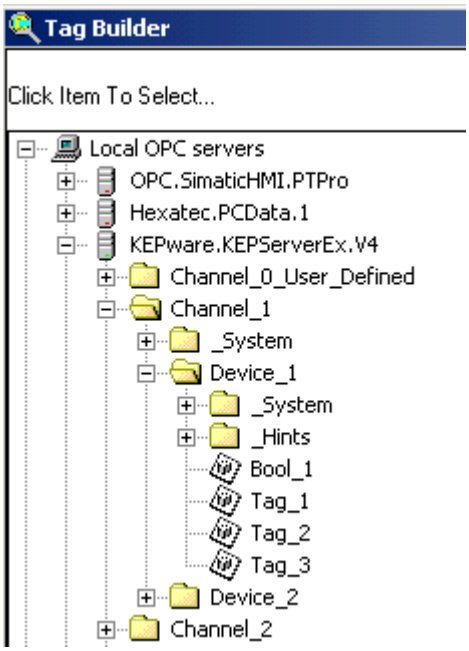
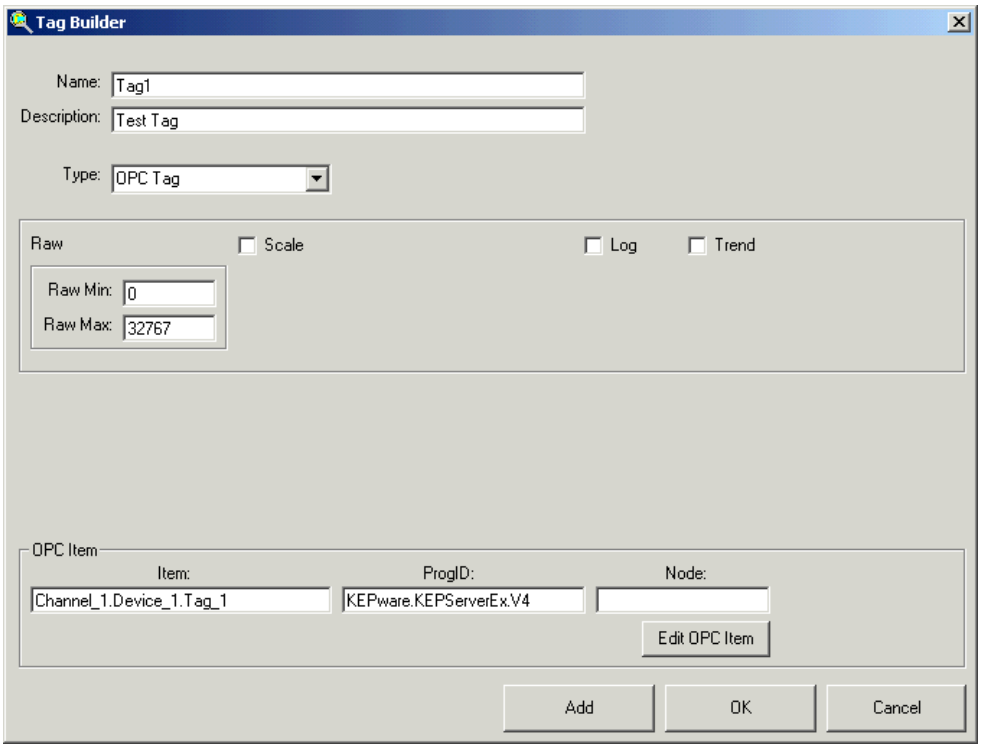
You should see the Program ID for KepserverEx, expanding it will cause ClearView to connect to the server and launch it if it is not all ready running. Once connected you will see folders for all the channels in the project that is loaded, we are using the SimDemo project. Expand the Channel, Device, and any subsequent Tag Group folders until you see the tag that you wish to associate with the your ClearView OPC item.

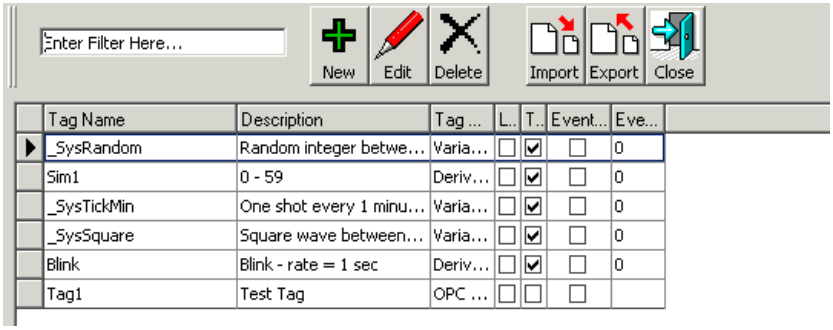



*When KepserverEx automaticall launches it will load the last project that was opened succesfully or the one that is set in the default project setting of the Tools|Options.. General Tab.*

Click on the a tag to select it. This will automatically assign the tag to the OPC item.




Click the OK button to add the new OPC tag to the ClearView Tag Database and close Tag Builder.

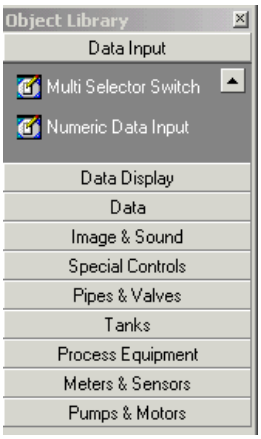



Click the Close button to close Tag Database View.

# Create a Screen

## Create a Screen to Display OPC Tag Data

Click on the Data Input group in the Object Library window and scroll down until you see the Numeric Data Input.




Click on Numeric Data Input to select a Numeric Data Input object. Then click with the mouse on the Green design screen and drag the cursor to create a Numeric Input Object.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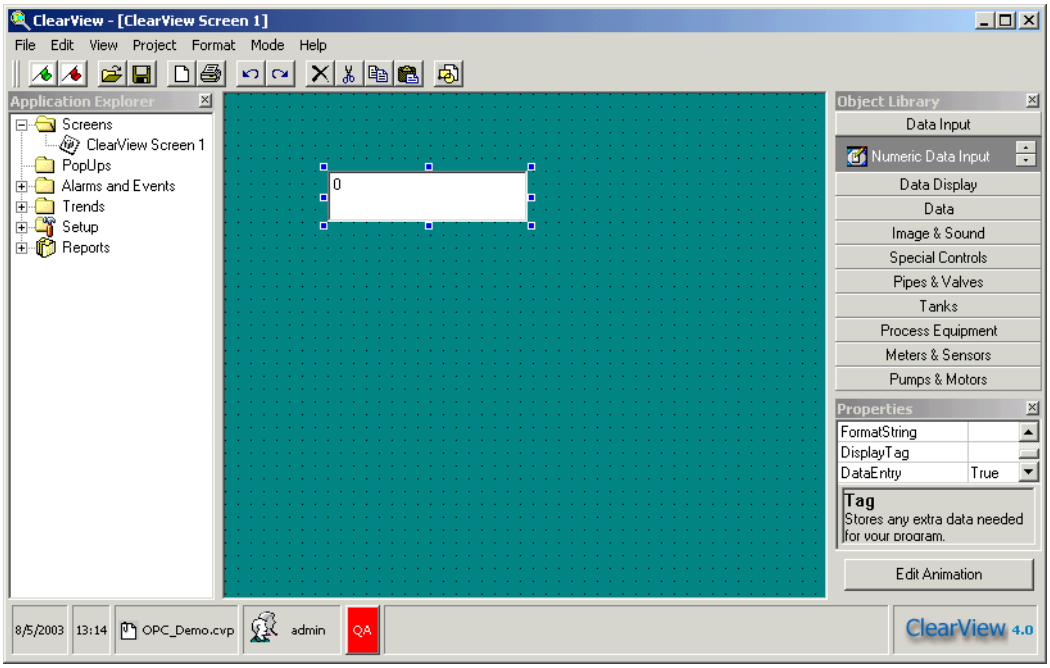
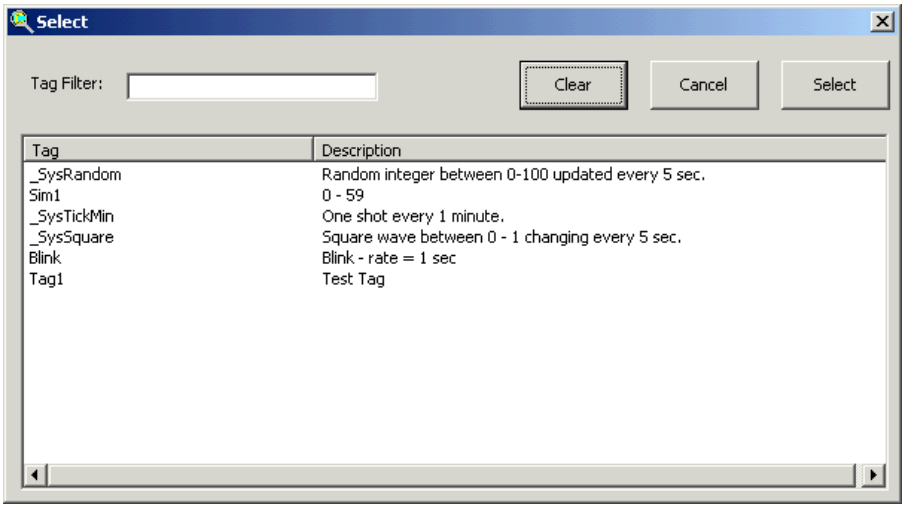



Making sure that the Numeric Data Input box is still selected scroll down the properties window until you see the Display tag Property.

Click on Display Tag, this will open the Tag Database browser from which you can select a tag to display.

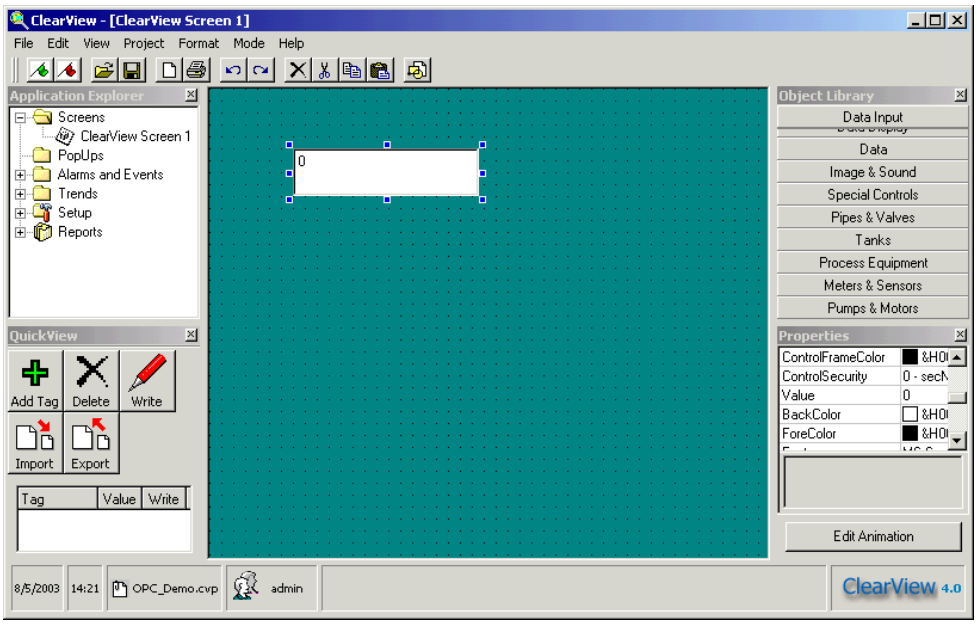



Click the tag you want in your display to highlight it and then click the Select button.

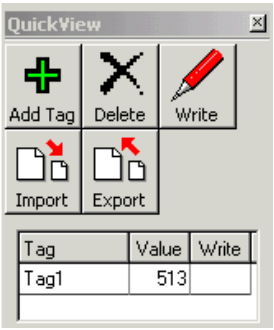
## View the Data

Click View|QuickView in the ClearView main menu to display the QuickView utility in the lower left corner of the screen

*The QuickView utility allows viewing of the specified tag value when the ClearView Server application is running.*




Click the Add Tag button in the QuickView window. Select the same tag that you chose for the Numeric Tag Input in the Select window.





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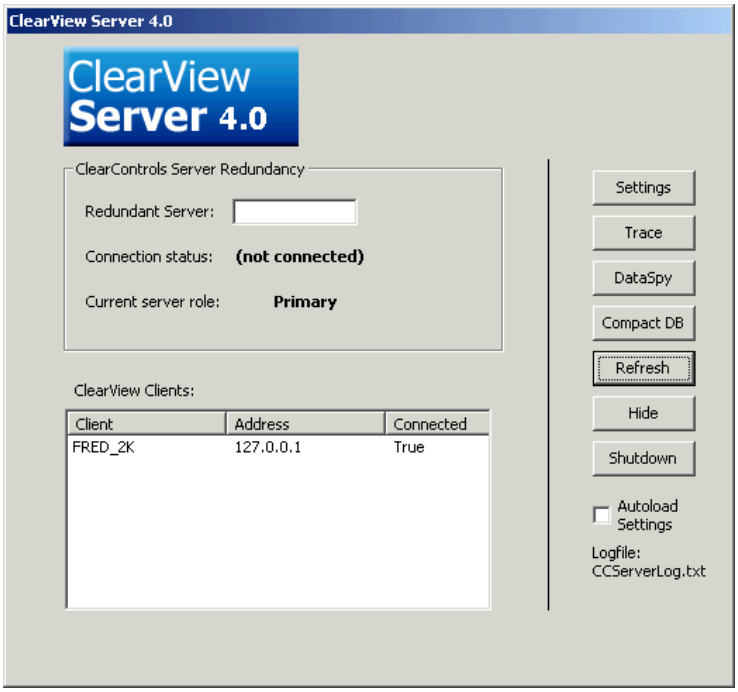
## Starting the ClearView Server

At this point, we will start the ClearView Server so that it is available to serve data to the project screens we have created in this section. Before starting the server, we will need to save our test project. It is a good idea to save the project before continuing.

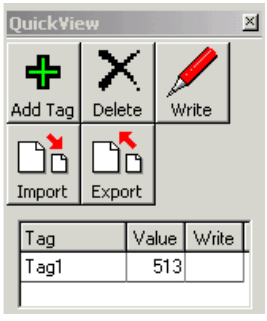
To launch the ClearView Server (CCServer) go to the Start|Programs menu. If the ClearView software is not registered you may be asked to register, if so click Evaluate and continue. Click OK at the "Please select a project file" prompt. Then select your project file from the appropriate folder.

> ***Note: After the ClearView Server has been launched, a server icon will be visible in the system tray.***

Double click on the ClearView Server icon to see that the server has been connected properly.



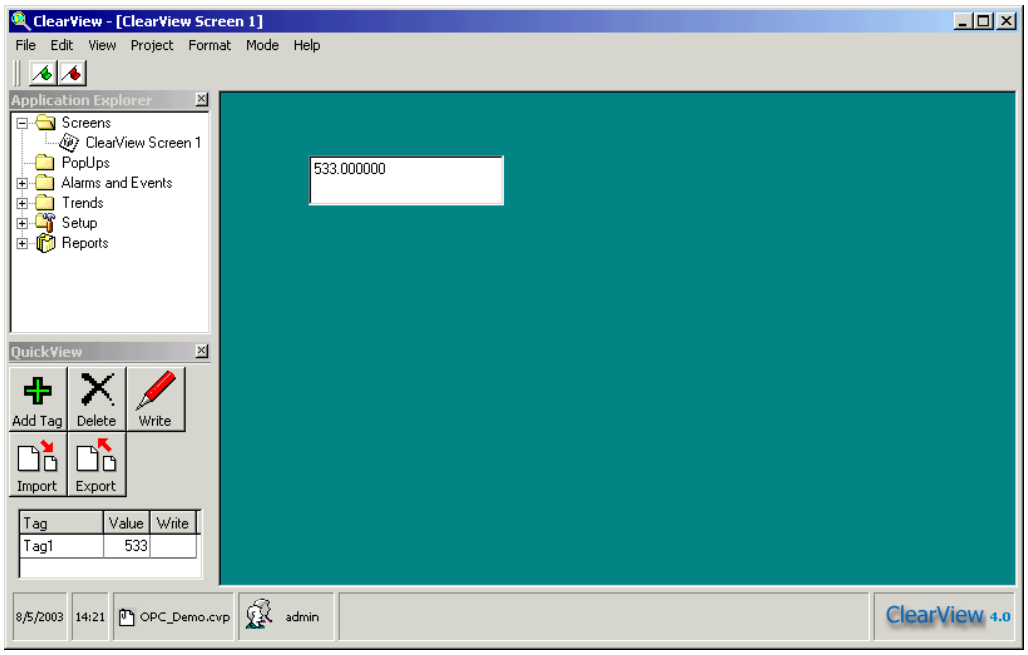

The connected status in the ClearView Server window will indicate "True" and you will notice the Tag1 values are showing in the QuickView window




Click on the Hide button to close the ClearView Server window.

# Run the Project

Now you can place the project into run mode by clicking on Mode|Design in the main menu to uncheck it. The new OPC Tag values will update in the Numeric Input Data object field.





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# Using Kepware’s OPC Quick Client

Kepware provides an OPC client application for testing purposes with each installation of KEPServerEX. For more information on Kepware’s **OPC Quick Client**, please see the OPC Quick Client help file.

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