

KEPServerEX Client Connectivity Guide

For Rockwell Software's RStudio



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32 Bit KEPServerEX Connectivity Guide

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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 common OPC client to KEPServerEX.

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 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 the server can communicate with it. If the server cannot communicate with the device, be sure to check the error messages and look up their meaning in the help file.

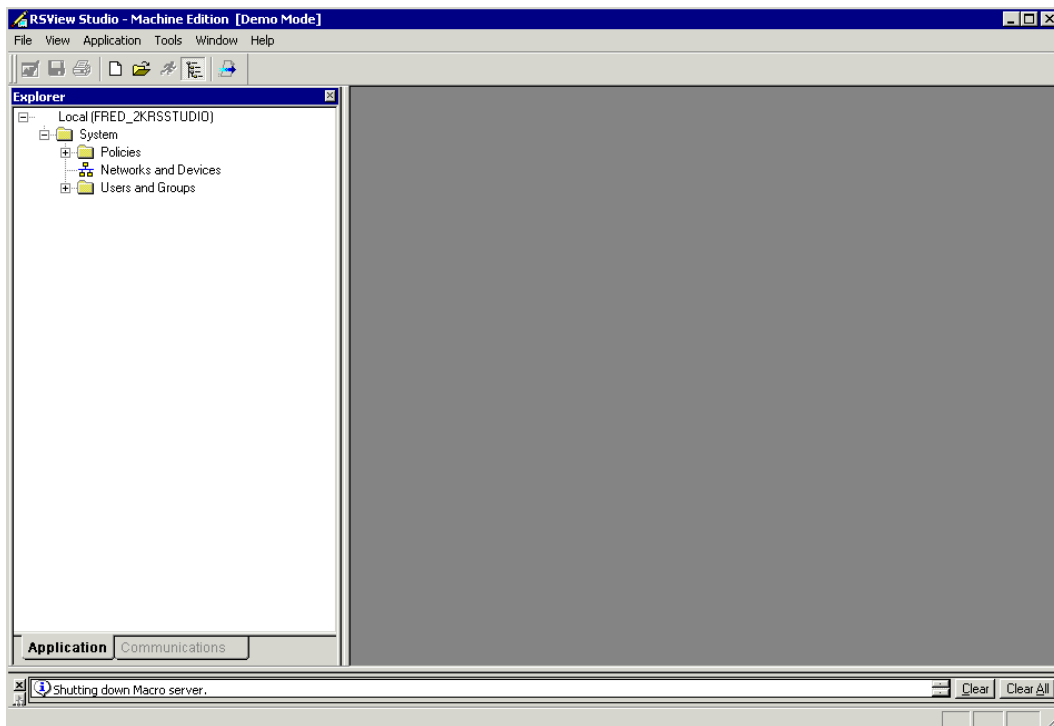
Rockwell Software's RSView Studio as an OPC Client

Connecting to the OPC Server from RSView

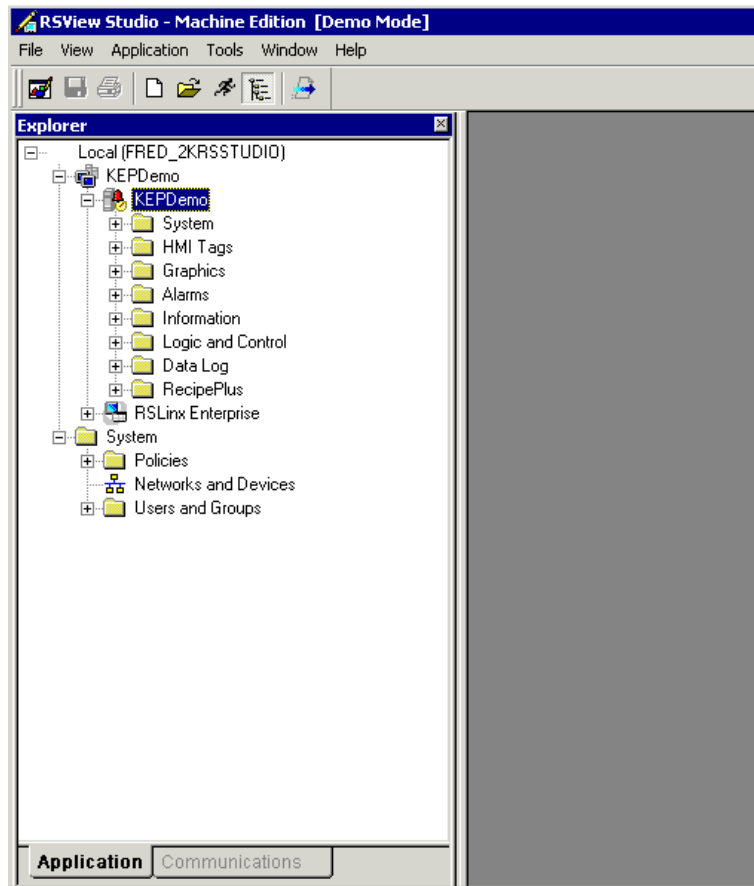
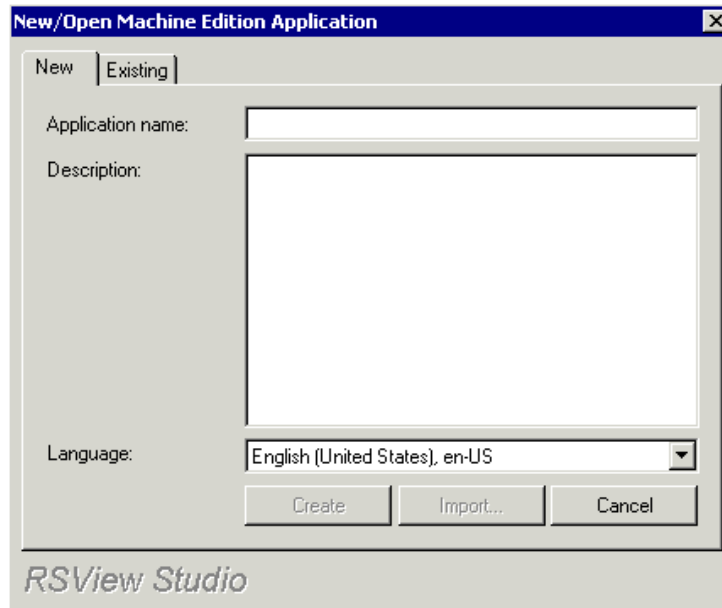
Rockwell's RSView family of OPC clients is one of many HMI's that can be used to connect to KEPServerEX. The RSView Studio version used for this example was version 4.0. All versions of RSView are configured in the same way with regard to connecting to OPC Servers. The following steps will show you how to create an OPC connection from RSView to KEPServerEX.

Create a new RSView Project

1. Open your copy of RSView and start a new project.

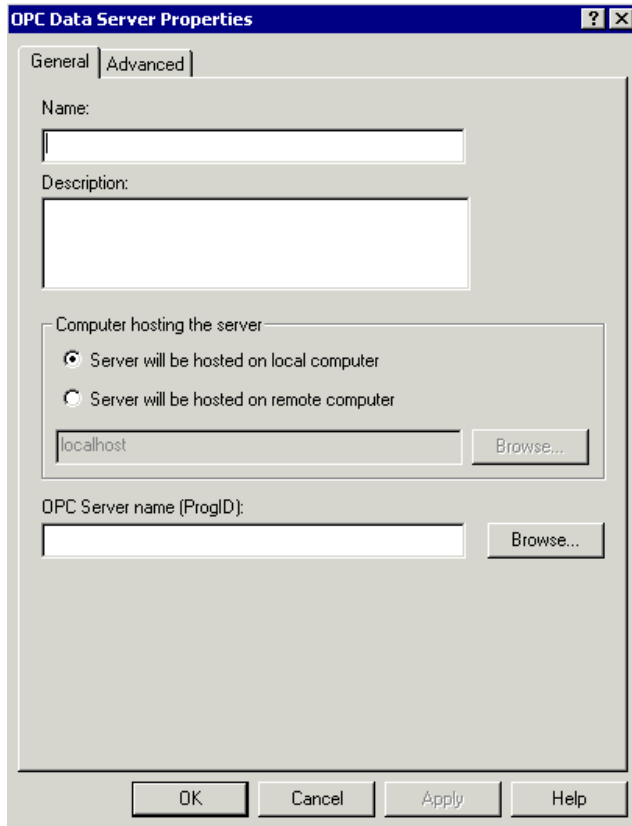


2. In the RSView Studio main menu, click on **File | New Application**.
3. In the dialog that is displayed, enter a name for the application you will be creating and a description if you wish. For this example, we named the application “KEPDemo.”
4. Click the **Create** button when you are done.



Create a New Data Server

5. In RSView Studio, click on the KEPDemo Project folder to select it.
6. In the main menu, select **File | New | Add New Server | OPC Data Server** to add a new OPC server connection to the project.



7. In the Server properties dialog, enter a name for your server connection.
8. Next, check the radio button indicating whether the server connection is local or remote. For our demo it is local.

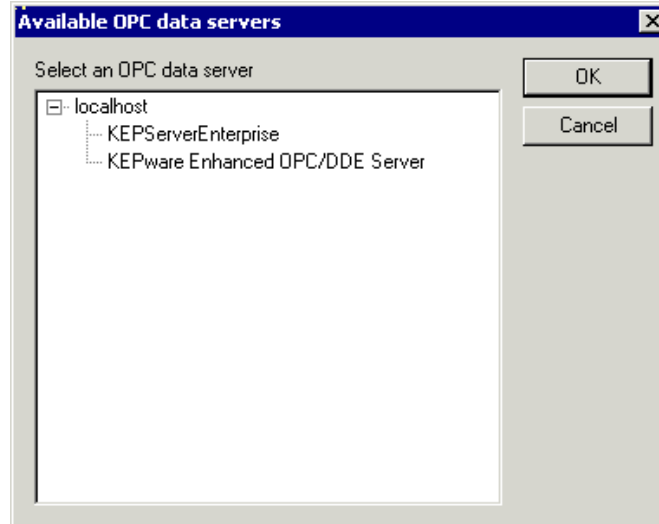
Browse for an Available Server

9. Lastly, click the **Browse** button to browse for the OPC server.

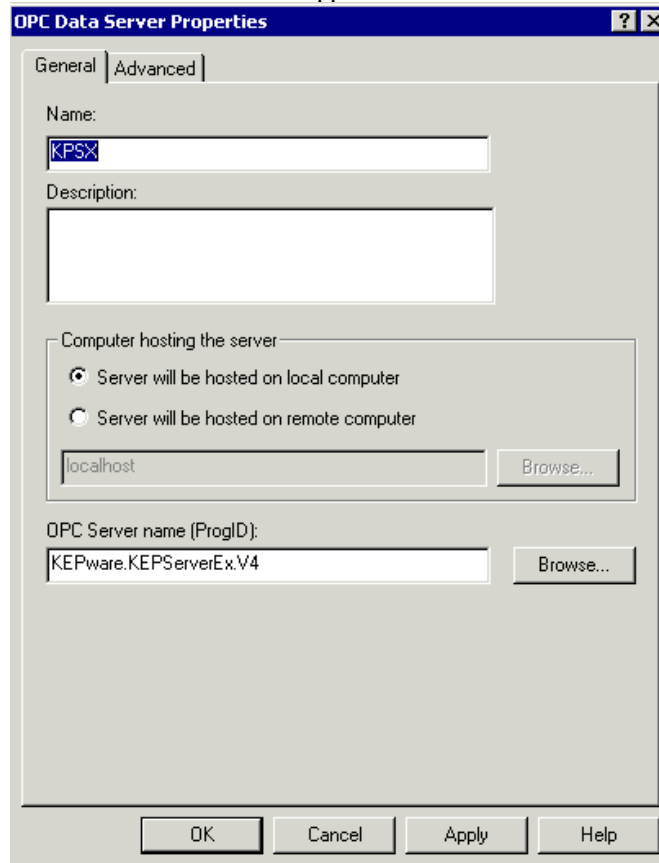
10. You should see the Kepware Enhanced OPC/DDE Server (KepserverEX) as a selection if that is the server you are connecting to.

The list displayed in the OPC Server Browser is pulled from the local PC, or remote if you selected remote and entered a valid PC name. If you do not see the server you are expecting to, you may need to configure DCOM security. See Kepware's "DCOM Configuration Manual" for guidance.

11. Select the server you wish to connect to and click the **OK** button.

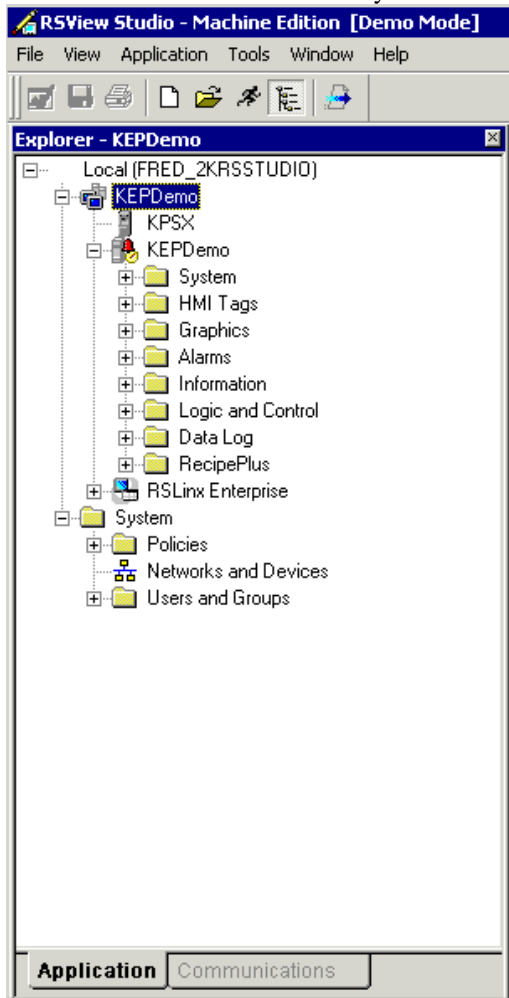


12. Make sure the server name appears in the Name field.



13. Click **OK** to accept the configuration.

14. You will now see the Data Server you created in the Project folder list view.

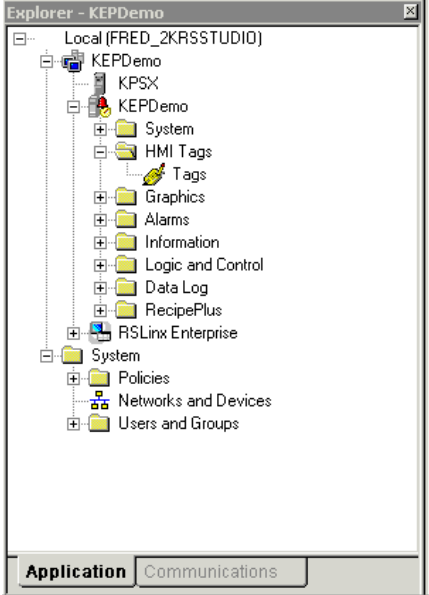


Collecting Data from the Server

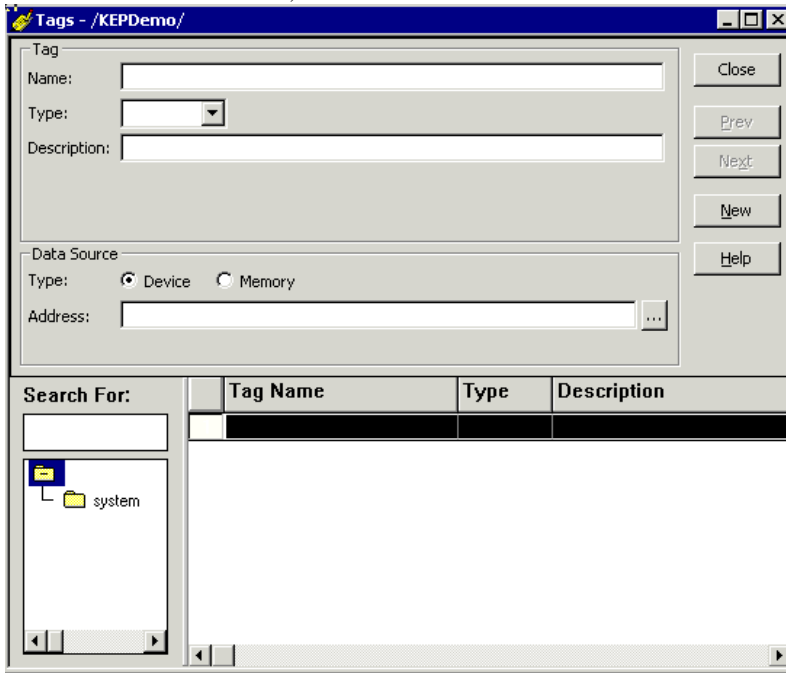
In older versions of RSView you needed to create tags to use as references to display data in forms and objects in your RSView project. In newer versions of RSView, you have several options. You can create a tag database, referred to as in-direct addressing, or you can access the OPC item directly using direct addressing.

Create a Tag for In-Direct Addressing


- 15. In the project folder tree, expand the "HMI Tags" folder.
- 16. Double-click on "Tags" to open the Tag Database dialog.



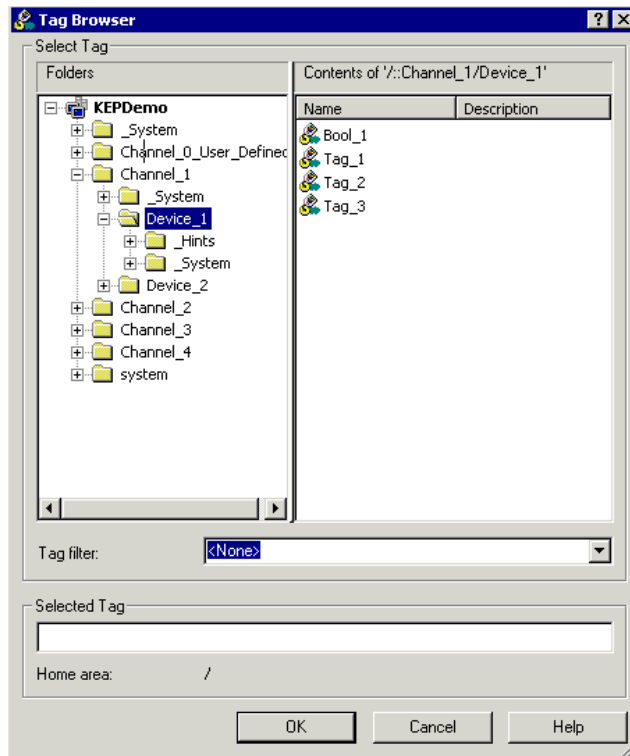
17. In the Tags dialog, enter a descriptive name for the tag.
18. Select a Data Type for the tag.
19. In the Data Source section, click on the **Device** radio button as shown here.



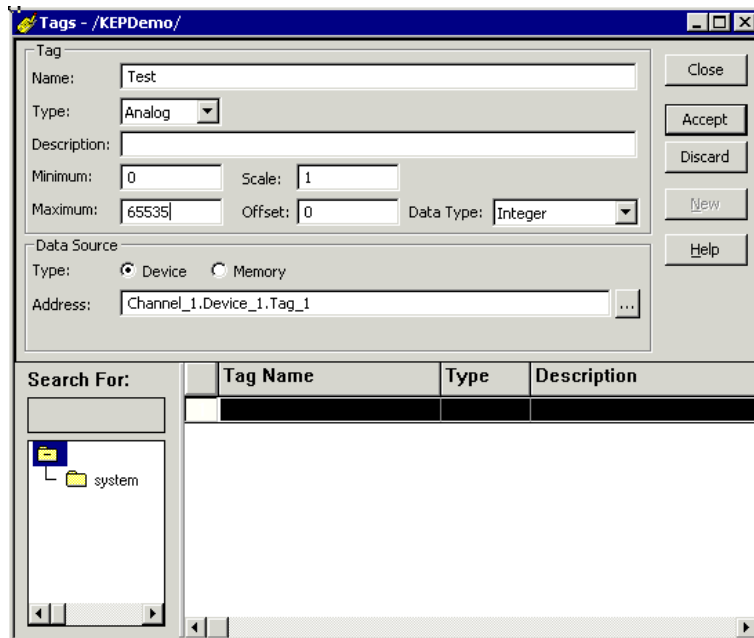
Browse for Tags in the Server

20. Click on the Address browse button  to open the Tag Browser.

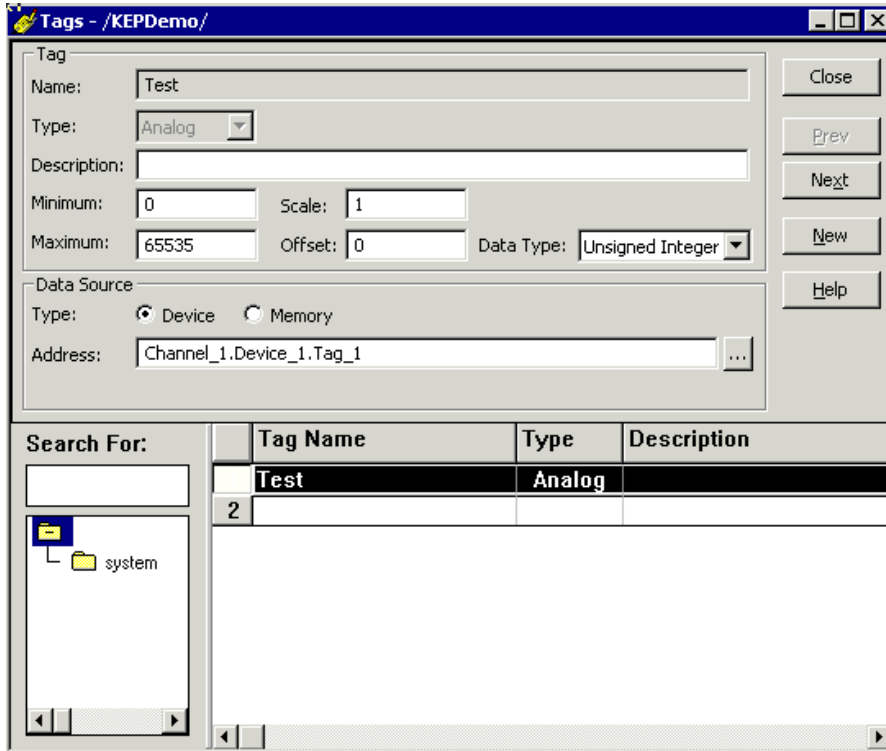
21. In the Tag Browser dialog, right-click on KEPDemo and select **Refresh** from the context menu. You will see all the Data Servers you have added to the project.
22. In the Folders pane (left side), expand the tree view of folders until you find the folder that contains the tag you wish to add. For this example, we are selecting Channel_1 / Device_1 / Tag_1.
23. In the right hand view pane, click on the tag that you want (Tag_1) and click **OK**.



24. The Tags dialog is displayed again. Note that the tag you chose is displayed in the Address field.
25. Review the other fields in the Tags dialog. Make sure the values in the following fields are set accordingly: Minimum, Scale, Maximum, Offset and Data Type.



26. Now click **Accept** to add the tag to the tag database.



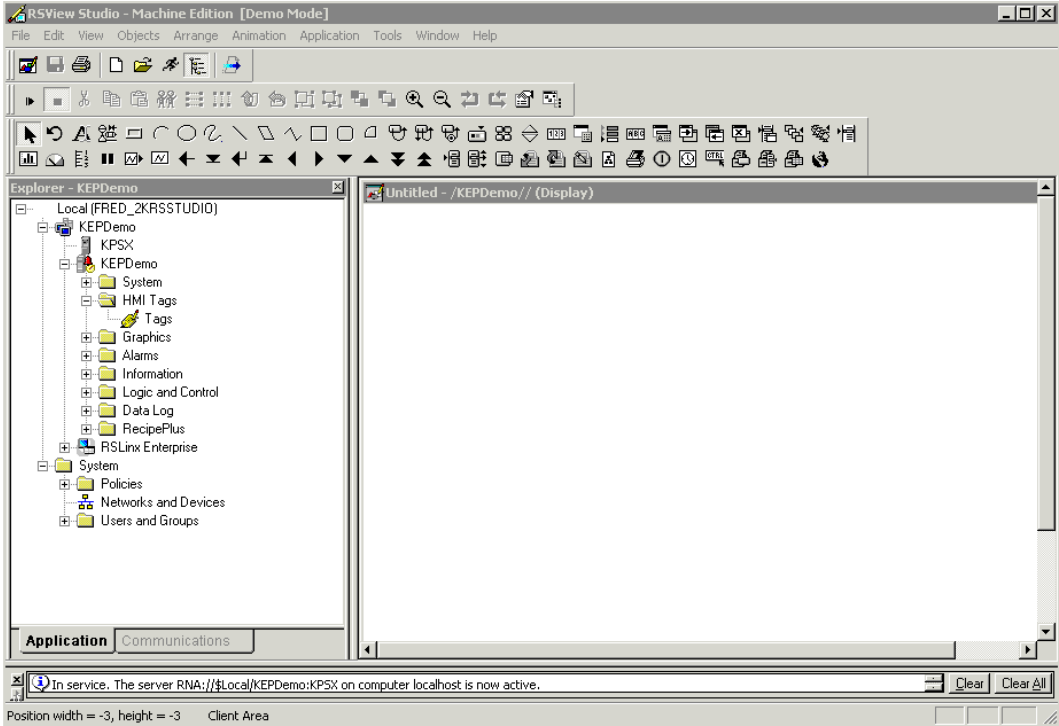
27. Click **Close** to close the tag database.

Check the OPC Connection

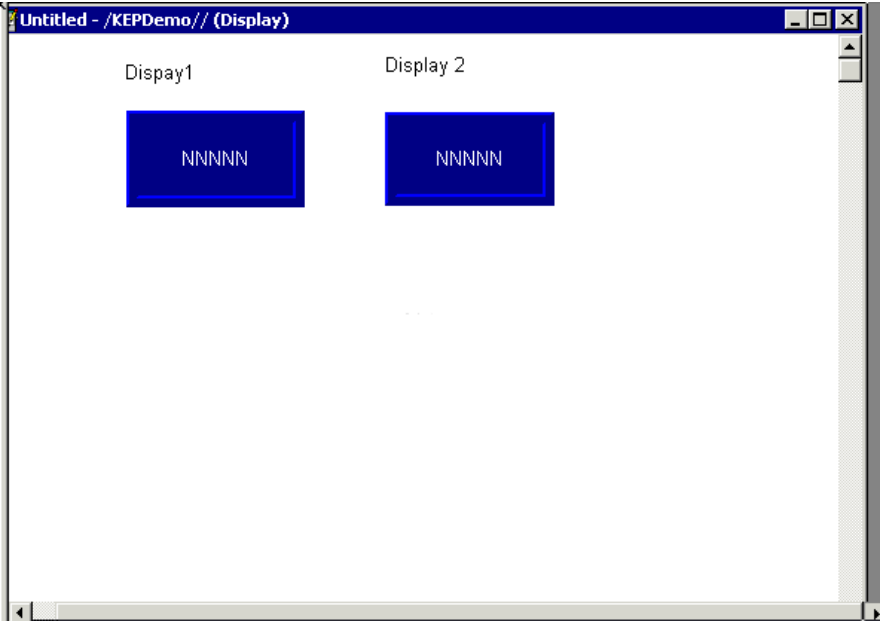
Next, we are going to verify a connection to the KEPServerEX “Simdemo” project. To do this you need to add a display to your project.

Create an RSView Project Display

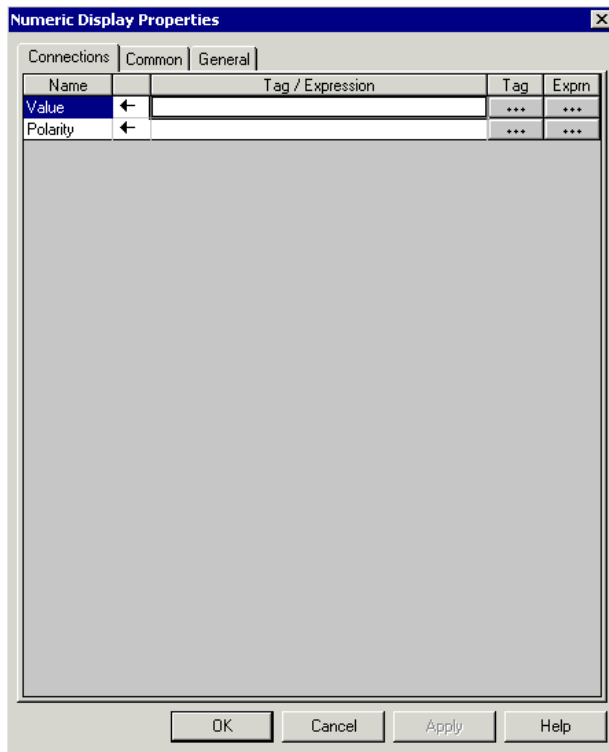
28. Click on the **New Display**  button in the main menu.



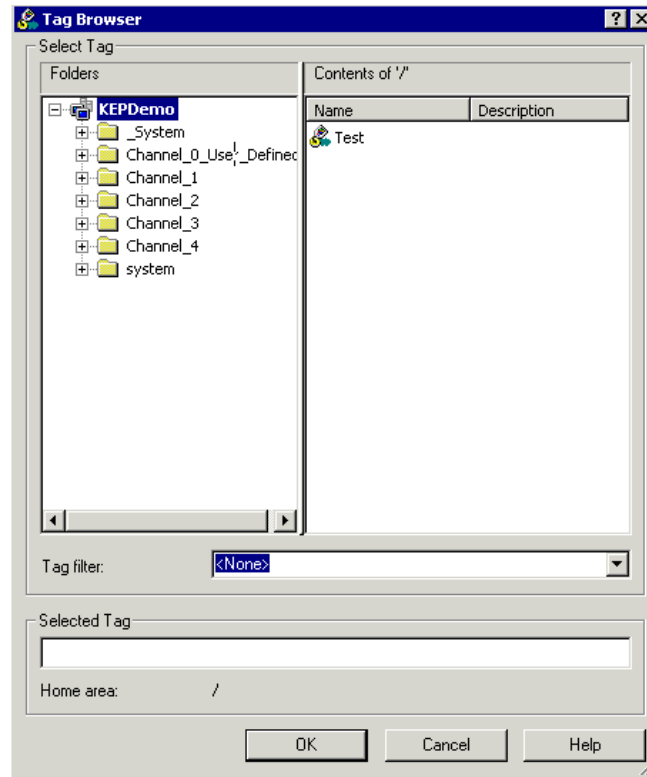
- 29. Add two text labels named “Display 1” and “Display 2.”
- 30. Add numeric displays under the labels.



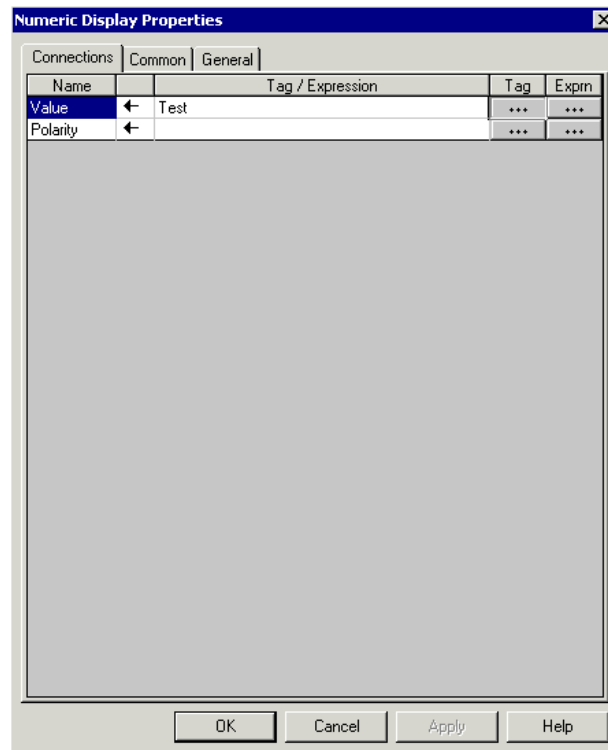
31. Next we need to automate the numeric displays to show data from the OPC server. We will work with the numeric display under “Display 1” first. Right-click on the object, and select **Connection** from the context menu.
32. In the Numeric Display Properties dialog, click on the Tag browse button for the display “Value.”



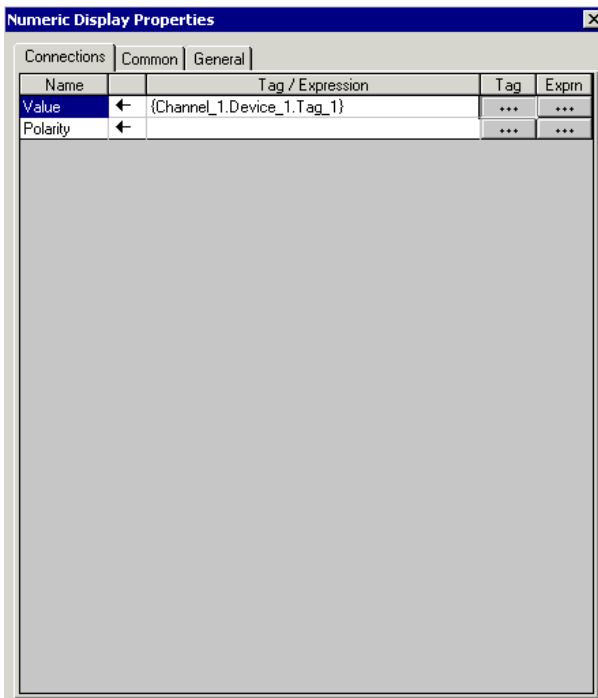
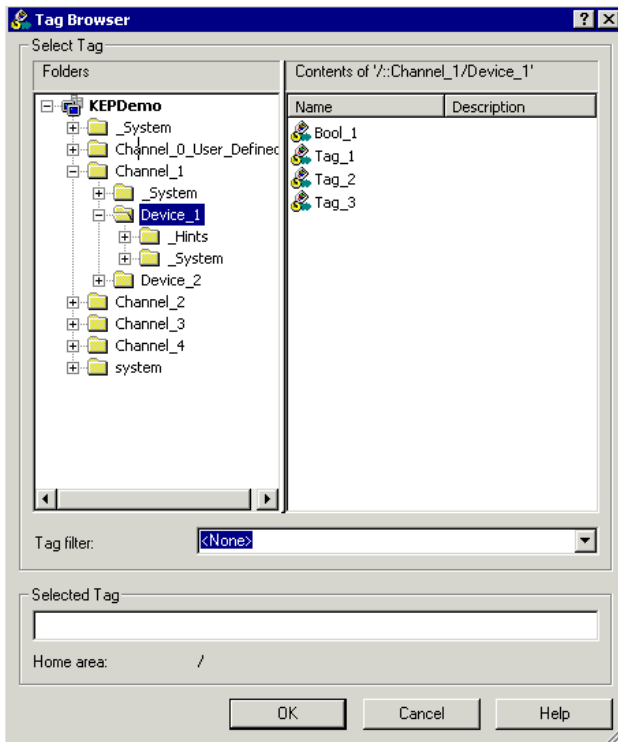
33. The Tag Browser dialog is displayed. Notice that both the folder view of the server and the tag that we create are displayed. We are going to use the tag that we create for Display 1 so double-click the tag “Test.”



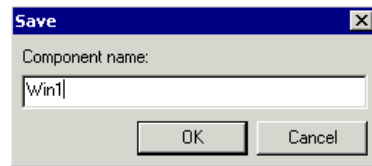
34. The tag “Test” is now displayed next to “Value.” Click **OK** to accept the tag.



35. Next, repeat the process for Display 2. This time we will be directly referencing an object in the server. As shown in the two screens below, we chose the same tag that we used for our In-Direct Tag.

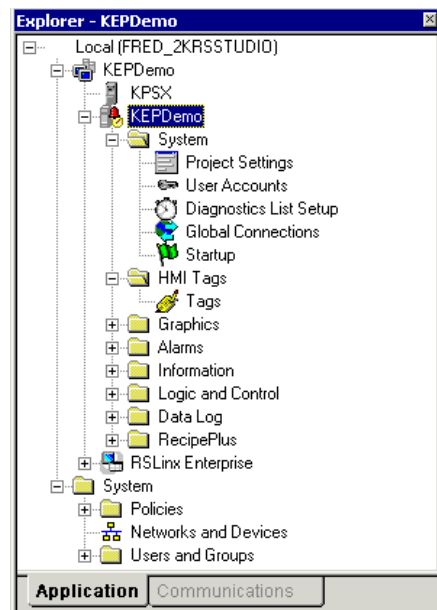


36. Click **OK** then save the display. For this example, we entered the name “Win1.”

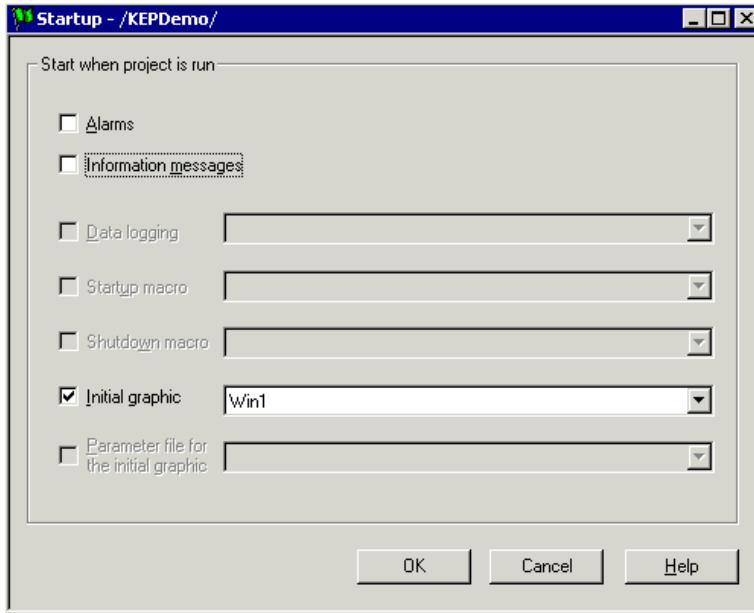


37. Next, configure the project to open your display at startup. First, expand the System folder in the Project folder view.

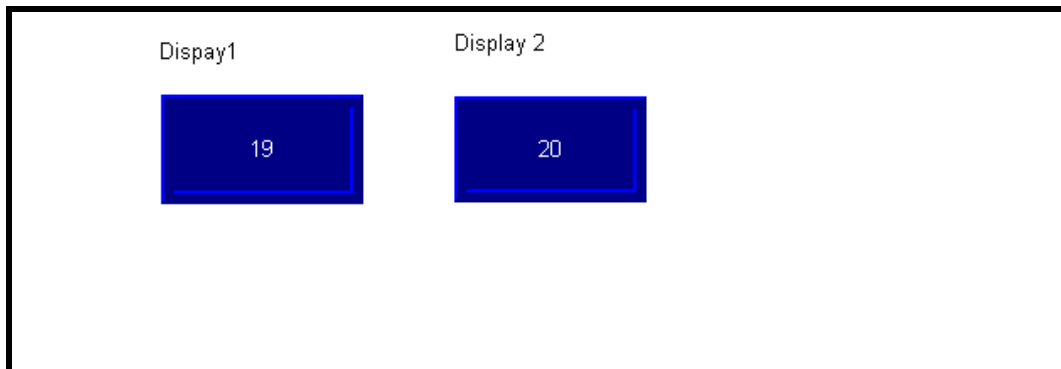
38. Double click on the Startup folder. This opens the Startup properties dialog.



39. In the Startup Properties dialog, uncheck both **Alarms** and **Information messages**.
40. Check **Initial graphic** and select the display, in this example “Win1.”



41. Click **OK** when you have finished.
42. Click on **Application|Test Application** to run the project in test mode.
43. Notice that In-direct tagged display updates slightly slower than the direct tagged display. This is because the In-direct tagged display must first update the RSView tag database and then display its update from the cache. The direct tagged object does not have to wait for this.



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.