# KepserverEx Client Connectivity Guide

## For Rockwell Software's RSView



**KTSM-00002**

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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

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 RSView32® as an OPC Client

## Connect to the Server from RSView32

Rockwell's RSView32 OPC client is one of many HMI's that can be used to connect to KepserverEx. The RSView32 OPC client version used for this example was version *6.3*. The following steps will show you how to create an OPC connection to the Server from RSView32.

1. Open your copy of RSView32 and start a new project.
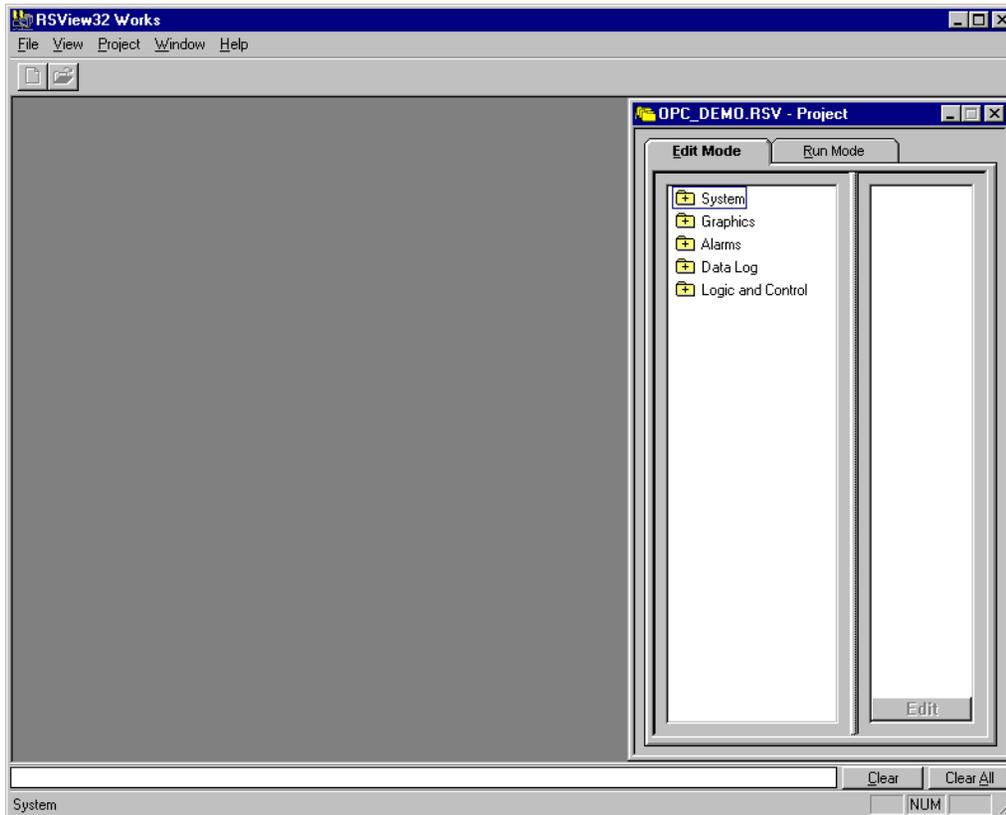
*KepserverEx is capable of being an OPC or DDE server to RSView. If your node is defined as an OPC node in RSView, then KepserverEx will be an OPC server to RSView. Likewise, if the node is defined as a DDE node in RSView, KepserverEx will be an Advanced DDE server*

## Create a Device Node

2. In RSView32 click on the System folder and then click on Node in the Project Control Panel. If you have multiple devices in the KepserverEx project, you may want to create multiple nodes in RSView and link them to the devices in the server.
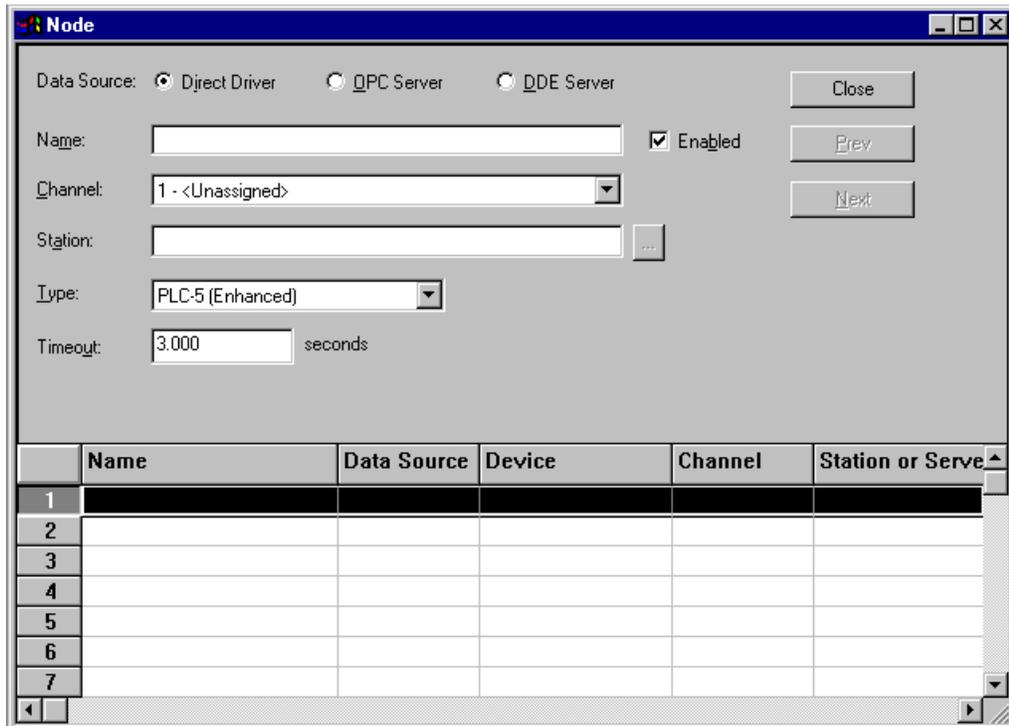
3. First we will select a Data Source for the Node; in this case it will be OPC Server.
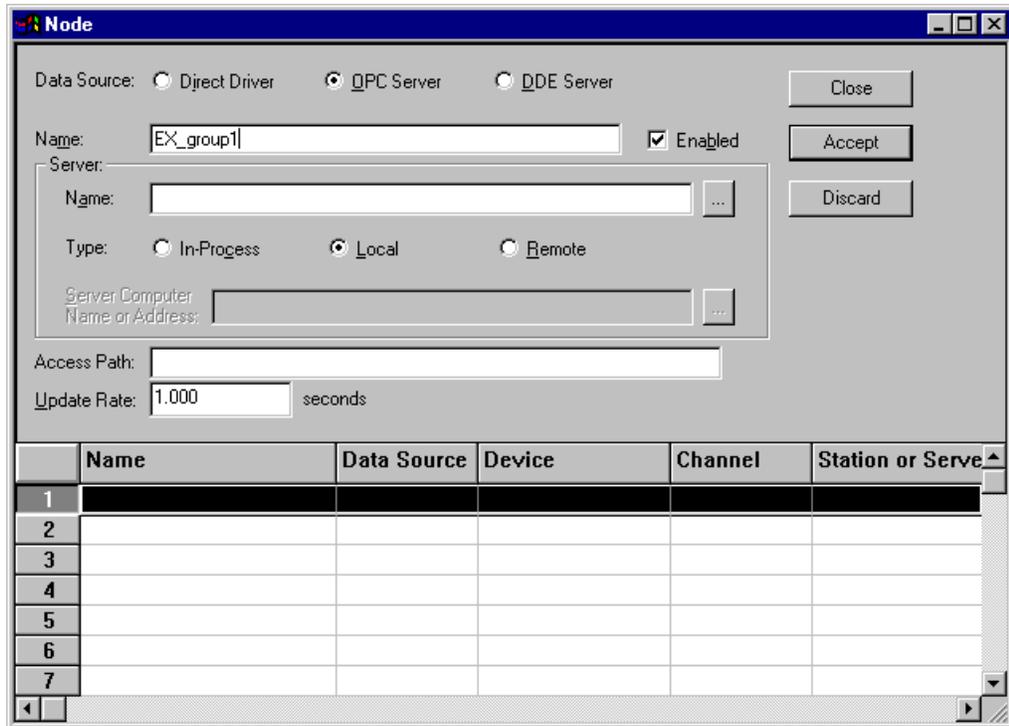


4. Next you will assign a name by which RSView will refer to the node. In this case we called it "Ex_group1" but you can assign a name of your choice.

## *Browse for an Available Server*

5. In the Server section you need to perform several tasks. First, you will click on the browse button ▣ and select a valid server Program ID for a local or remote server. .

   The list displayed in the OPC Server Browser is pulled from the local PC even for remote connections. Because of this you will have to configure the DCOM settings for the server, see Kepware's "DCOM Configuration for KepserverEx" guide

   If you have your server running on a Win 95 or Win 98 box you will have to have DCOM installed, configured, and running, in order to allow access to the server.

6. Select "KEPware.KEPServerEx.V4" from the list of servers.
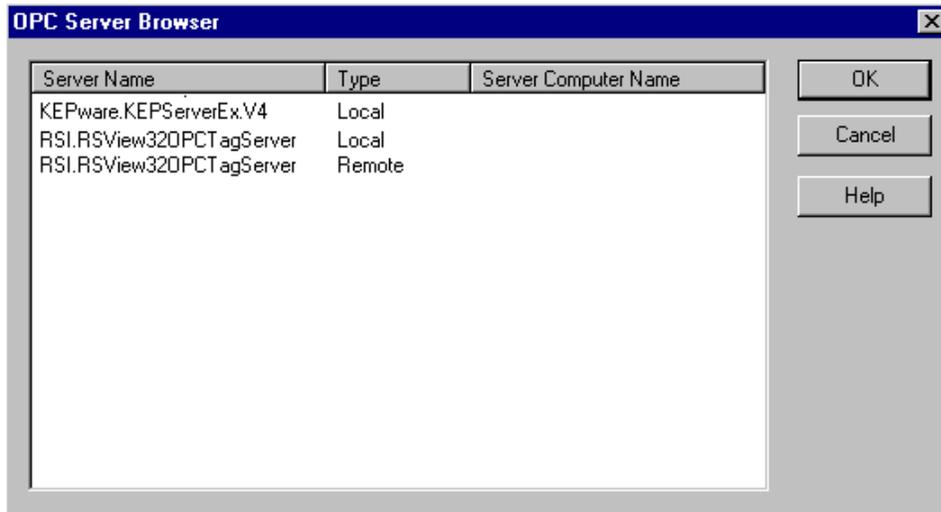


7. In the Server section select the Type of connection you are going to make to KepserverEx. Select Local for connection to a server on the same PC as RSView. Select Remote to connect to a server running on another PC. Selecting Remote will enable the Server Computer Name or Address field. You can enter either a name like "Remote_Station" or IP address like "120.150.11.90" for the PC running the server.
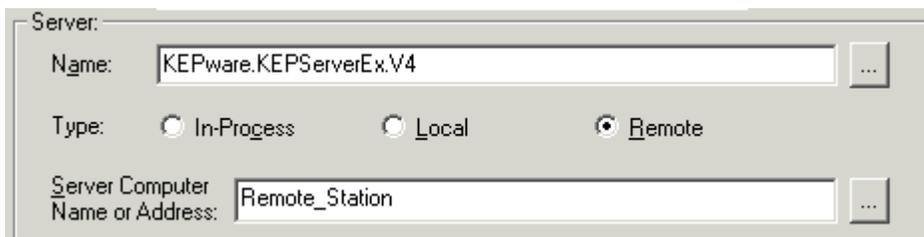


RSView allows you to create the node with or without an Access Path. We have left this field blank. By leaving the Access Path blank RSView is able to link to any tag within the server from this node. This means you can access tags from multiple devices in the KepserverEx application. If we had entered an Access Path, then only tags from a single device could be accessed through this node.

Make sure that Enabled is checked so that the node will connect to KepserverEx when you run your RSView project.

8. Set the Update Rate to 0.

This tells RSView that KepserverEx will use the fastest possible rate to send data. If you design a large RSView project with multiple nodes, you may want to slow down the update rates of your nodes
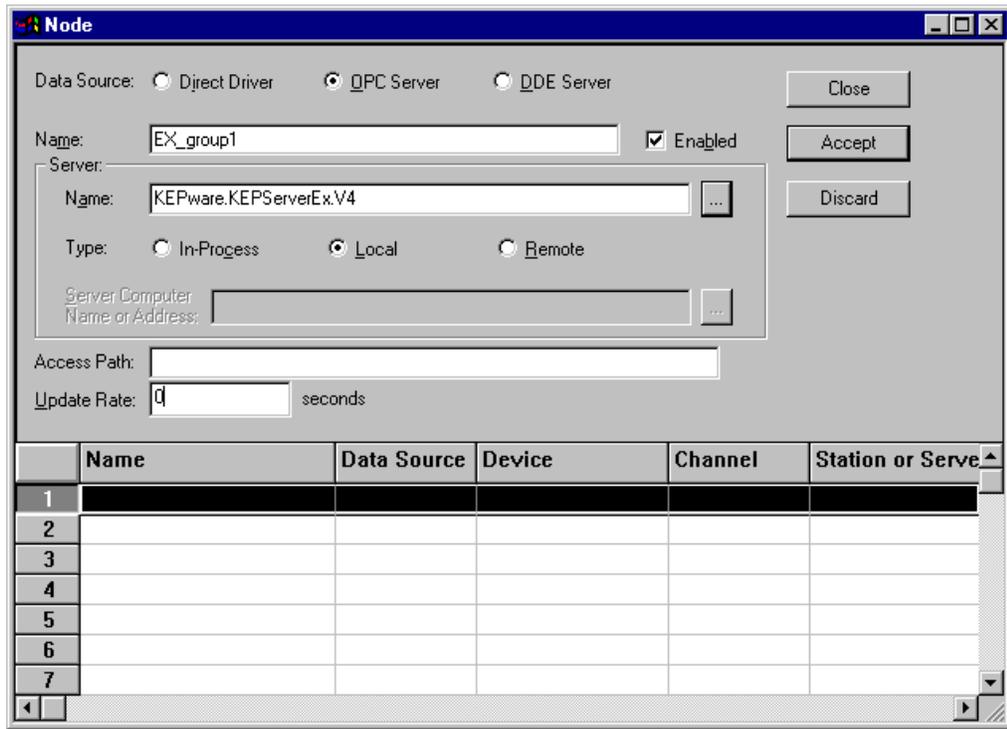
9. Click Accept and Close in the Node dialog box.

## Create a Tag

Next, create a tag or tags to access the data in the devices.

10. In RSView32 click on the System folder and then click on Tag Database in the Project Control and open the Tag Database dialog box.
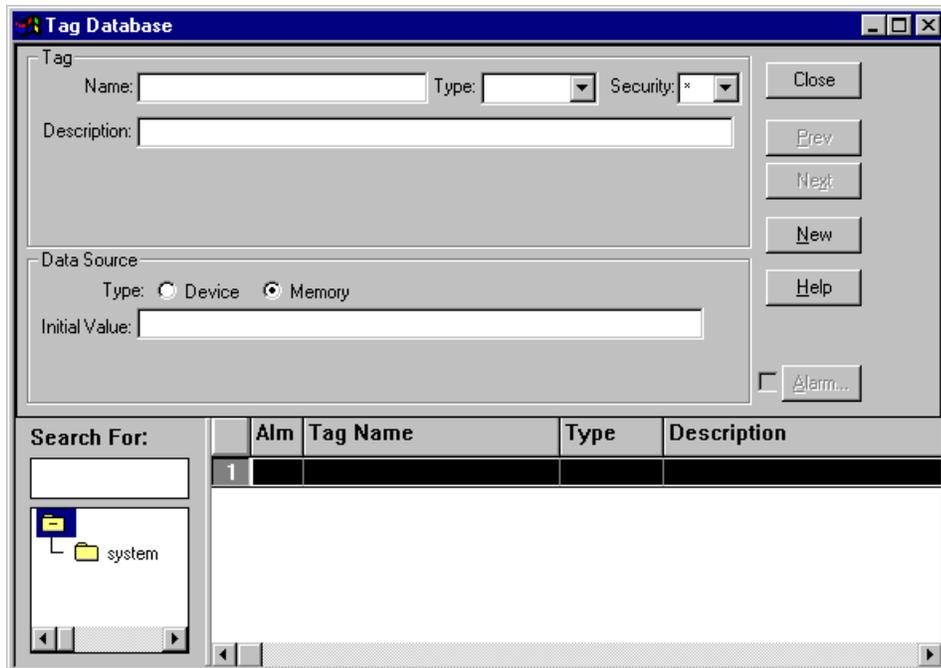


11. In the Tag Database, enter the tag description information as you would for any Rockwell driver

12. In the Data Source section Click on the Device radio button.
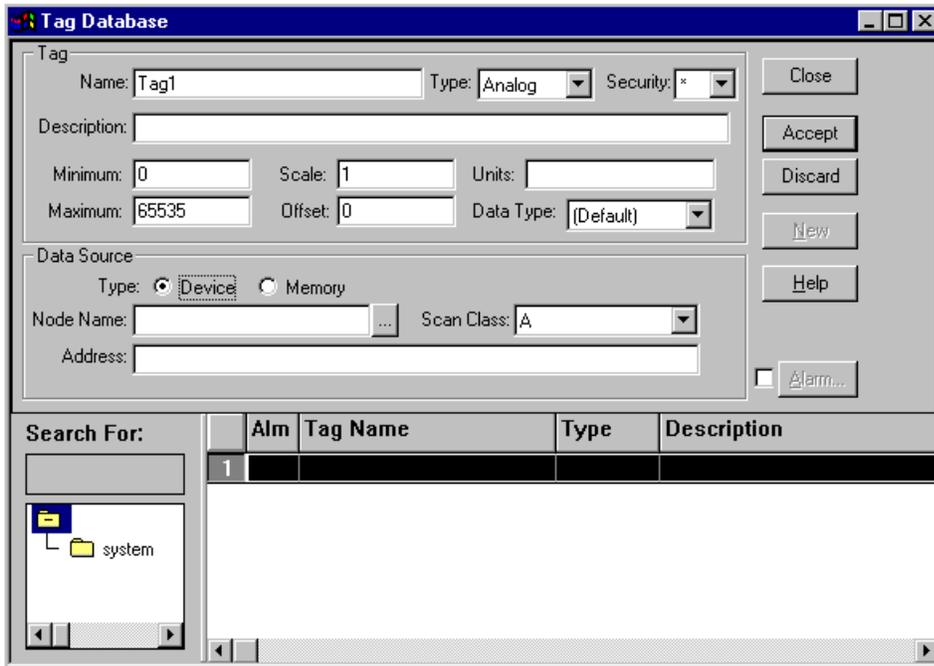
13. Click on the Node Browser button ▭ to display the Node Browser window.
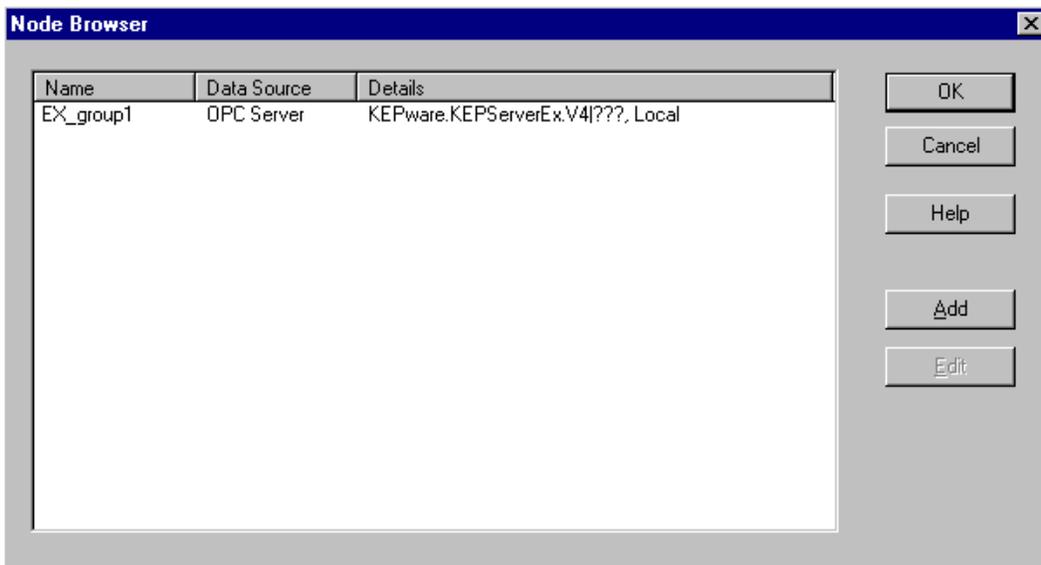


14. In the Node Browser select a Node Name and click OK to assign the node to your tag. In our example we have only the "Ex_group1" node that we added

*Browse for Tags in the Server*

15. Click on the Address Browser button ▭ located to the right of the Address field.
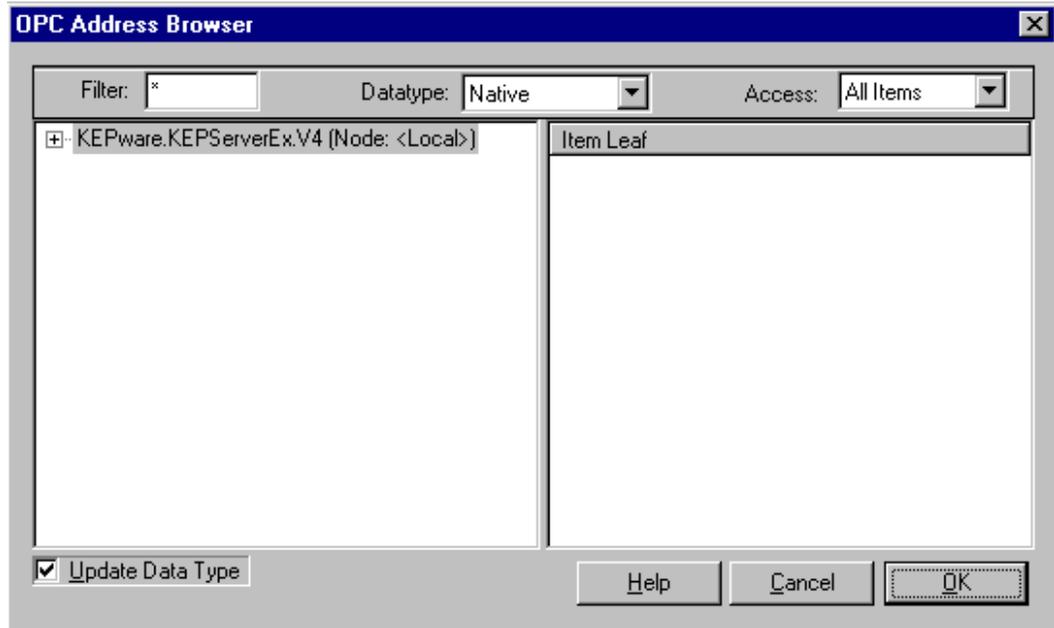
16. Using the tree view in the left pane of the OPC Address Browser window, select the Device or Group from which you wish to select Address items/tags. We are selecting Tag_1 in Device_1 on Channel_1.

Remember that these are tags that have already been defined in our Simdemo.opf project.
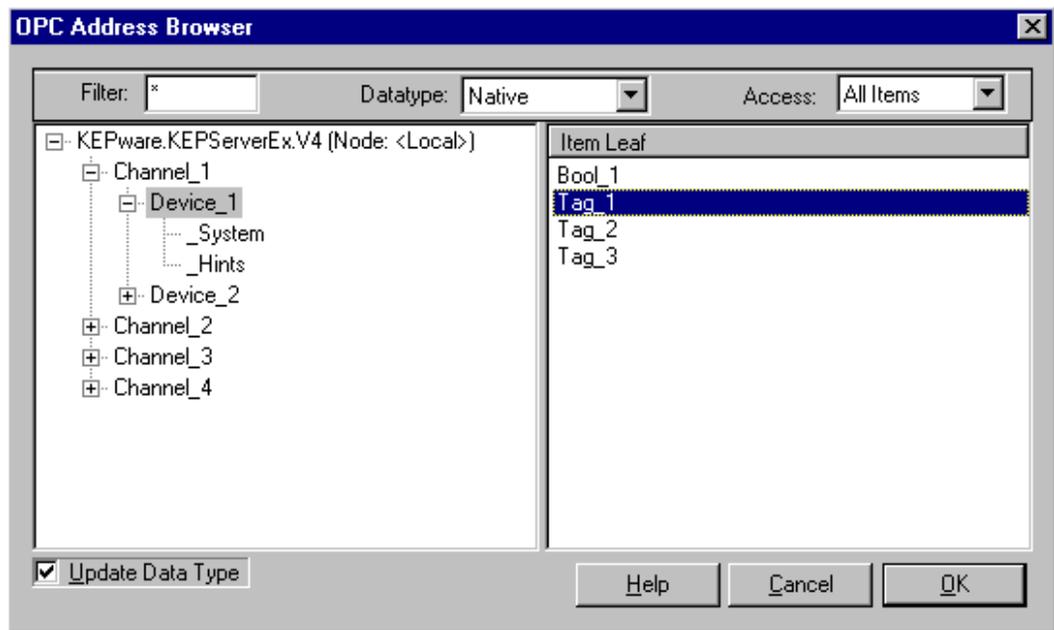


17. After you highlight the tag, click <u>O</u>K to add it.

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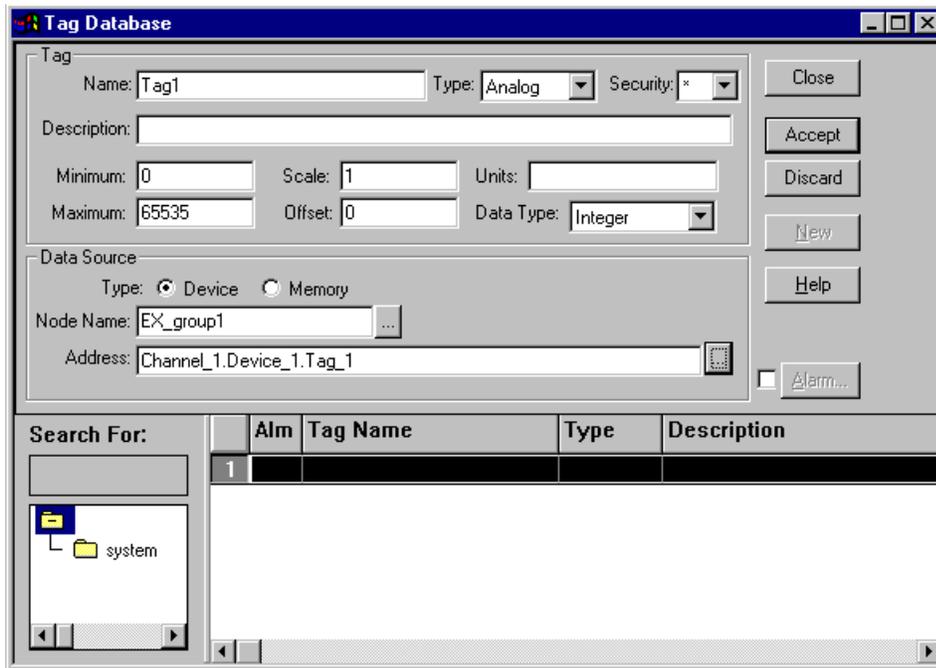
18. Now click Accept to add the tag to the RSView tag database.
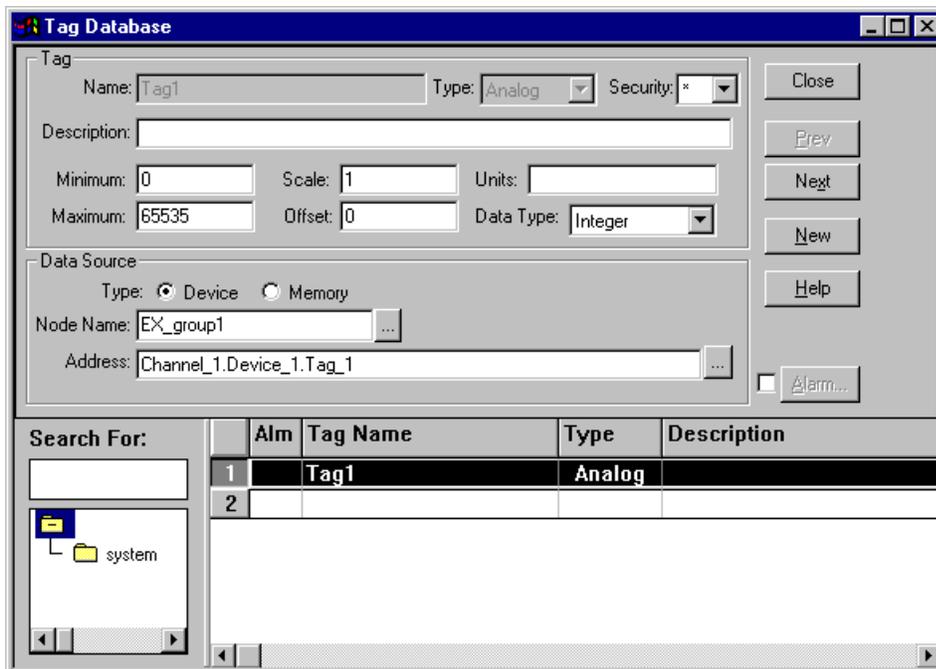


19. Click Close to close the tag database.

## Check the OPC Connection

Next we are going to verify a connection to the KepserverEx "Simdemo" project.

20. To do this, double click on Tag Monitor in the System Folder.

21. Enter the Tag Name or names that you want to check.  In this case we entered "Tag1" which is the name of our tag that we added.

22. Hit the Enter key after typing in the tag name.



23. You should see a State of "valid" in the Tag Monitor window for the tag and a Value that is ramping or incrementing very quickly.

24. You have now established a good OPC connection to KepserverEx from RSView

# Upgrading your connectivity from Kepserver to KepserverEx

KepserverEx is the latest generation of Kepware's OPC server technology. Building upon the original KEPserver, KepserverEx has incorporated many of the features requested by Kepware's customers. In addition to customer driven enhancements, many technological changes have occurred. These features and enhancements have all been made with the goal of providing an OPC server that demonstrates unparalleled compatibility and performance.

*This section is for users who are interested in upgrading from an existing Kepserver version 3.21 or earlier to Kepware's latest enhanced OPC server KepserverEx V4.0.*

If you are an existing Kepserver user you may want to consider upgrading your server to KepserverEx. Please contact Kepware to inquire about upgrade pricing.

If you have a copy of KepserverEx and you would like to test connectivity with your existing RSView application please use this section to convert your Kepserver and RSView applications. Although these upgrades should be very simple, we recommend saving backup copies of your projects in case you encounter any problems.

This section is for users who are interested in upgrading from an existing Kepserver version 3.21 or earlier to Kepware's latest enhanced OPC server KepserverEx V4.0.

## Converting From Kepserver OPC to KepserverEx OPC

1. The most important thing to know is that you do not have to recreate your server project. All that you have to do is open your existing .kdp Kepserver project file in KepserverEx. Select File|Open from the Main menu of KepserverEx.
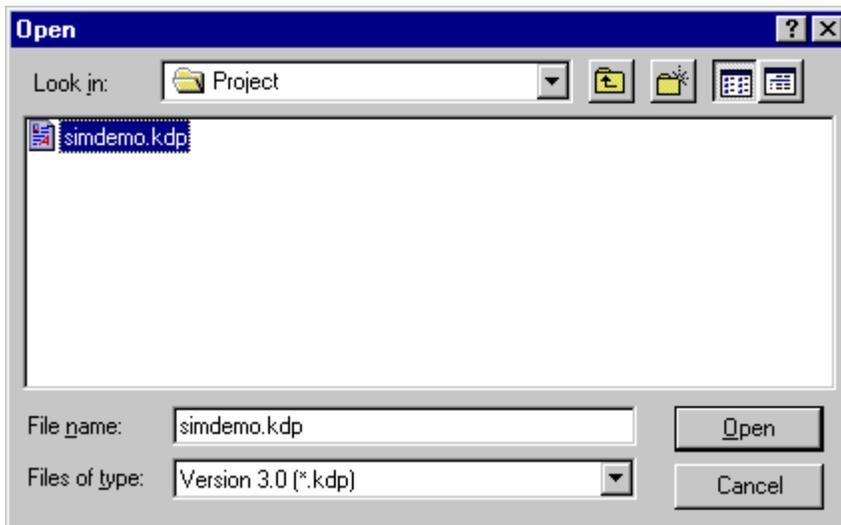


2. In the File Open dialog select "Version 3.0 (.kdp)" from the Files of type drop down box.
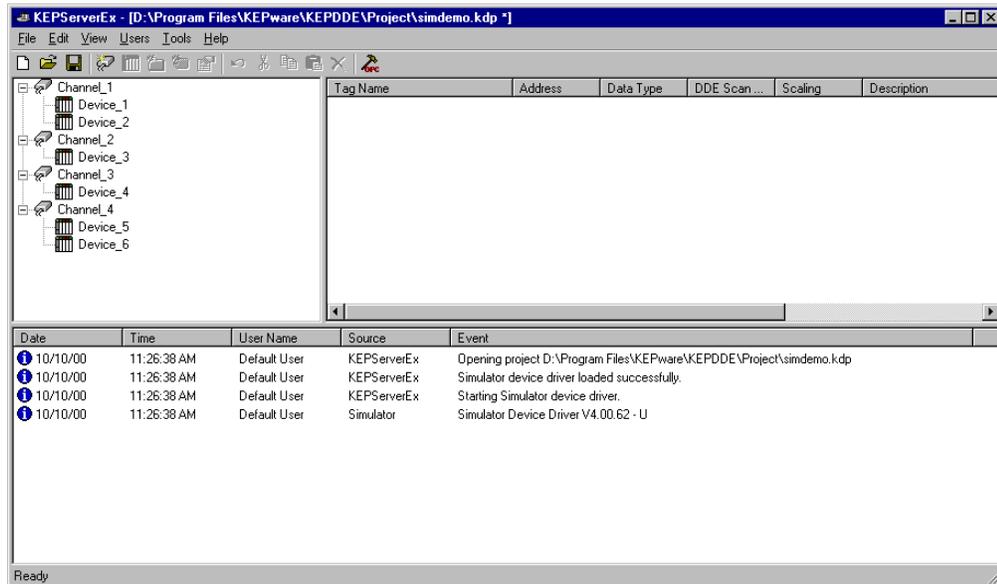
Once the project is open in the new server you will need to save it as a new server project. This provides two functions for you. First it converts the project to the new server project model (with a .opf file extension). Secondly, it enables the backward compatibility in your project so that the impact of converting to the new server is minimal.

3. Click File|Save to save your project.

If you refer to the Simdemo.opf project that installs with KepserverEx, you will be able to directly refer to the Alias map shown in the next step.

4. To see how this is accomplished click on Edit|Alias Map… in the main menu.
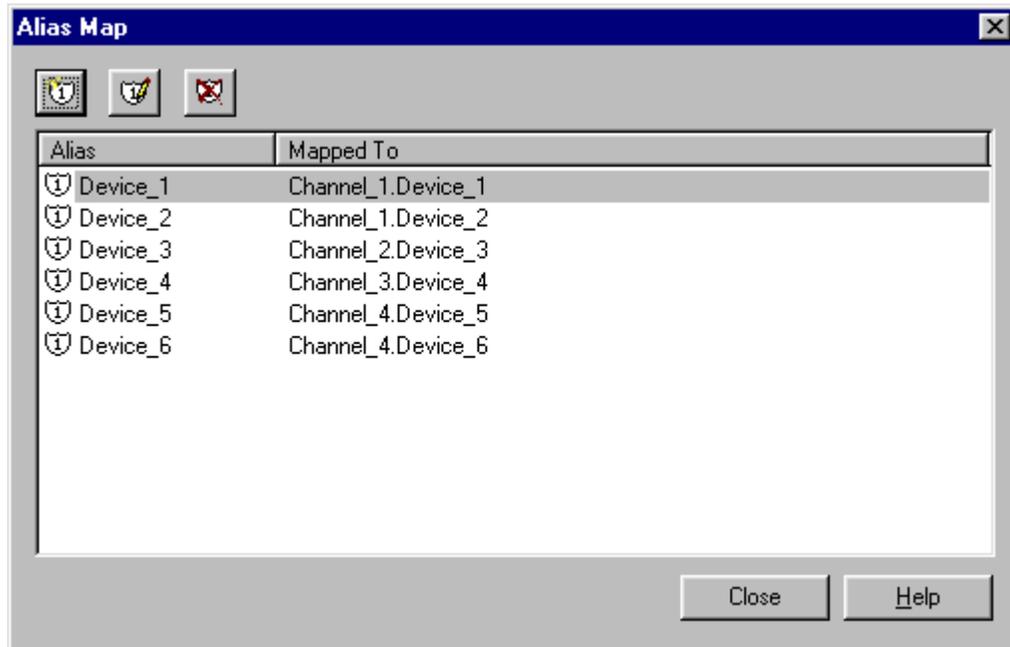


You will notice that an Alias was created for every device in the project and that each Alias was mapped to its appropriate channel and device. In Kepserver V3.21 and earlier, items were referenced at the device level ( "device.item"). In KepserverEx V4.0 and newer, items are referenced through the channel and device ( "channel.device.item"). The beauty of this is that you can upgrade without having to make any changes at the tag level of your OPC client application. You only need to make reference changes at the node level, as you will see in the next step.

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If you were to save the server project and re-open it and look at the aliases, you would notice the addition of aliases. These aliases are automatically created and updated by the server whenever you add, modify or remove channels and devices in the server in any project.
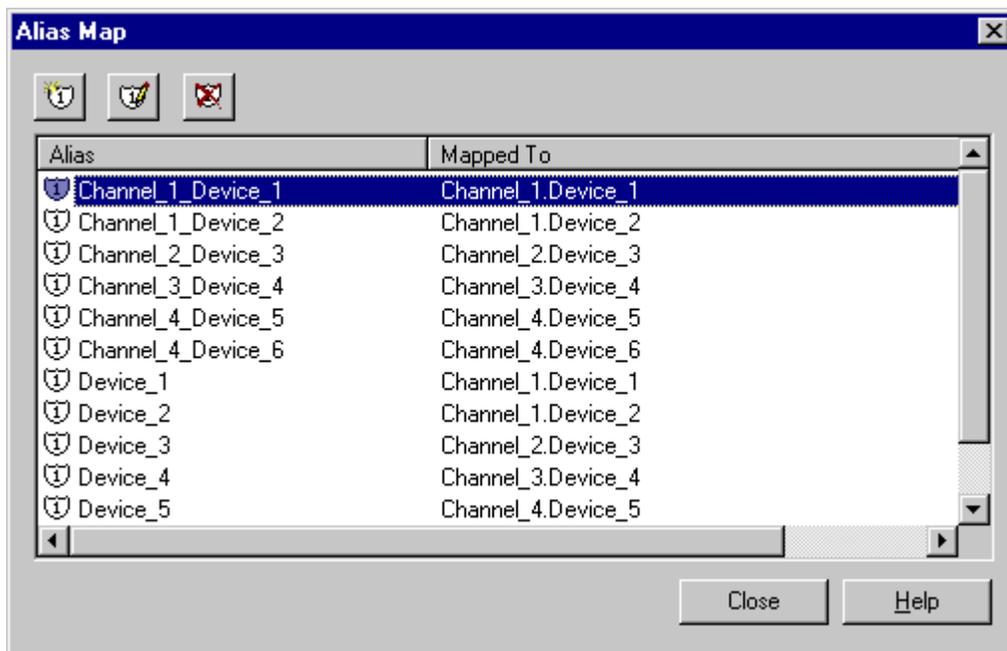


In your RSView32 project you will need to edit the node and update the OPC Server Name that is referenced.

    5.   Go to nodes from the System folder then select the Kepserver node.
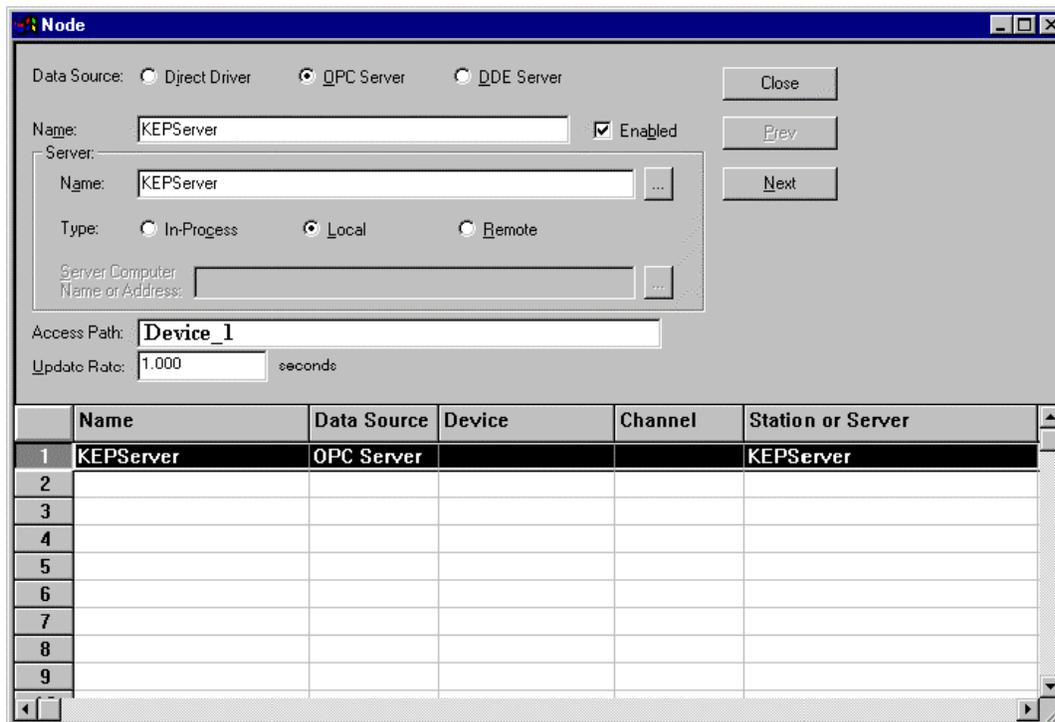


    6.   In the Server selection area, either click the browse button [...] and select the new server or enter "KEPware.KepserverEx.V4" as the new server name.

In Kepware documentation, this server name is also referred to as the Program ID or Prog ID.  If you have an existing Access Path entry, you can update it to reflect the newer item connection

format (i.e. channelname.devicename). However, it is not mandatory to edit the Access Path entry.

    7.    Click Close to accept the new changes.

Now you should be ready to save and run your project. You should not need to make any other changes to your RSView32 project, the Alias names created in KepserverEx should take care of all existing tag references

## Converting From Kepserver Advanced DDE to KepserverEx OPC

1. See steps 1-7 in "Converting from Kepserver OPC to KepserverEx OPC" about converting your old server project to the new server model

2. Next, in RSView32 go to Nodes

3. Select your existing DDE Node. Remember that a DDE node points at the specific device whereas an OPC node points at the server
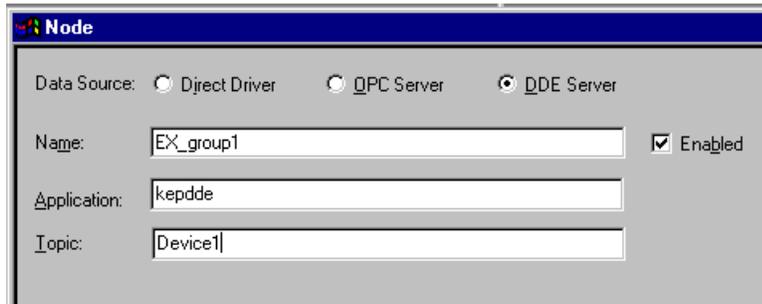


4. Next you will click on the OPC Server radio button.

5. Click on the Browse button [...] and select "KEPware.KepserverEx.V4". Next, you will need to enter an access path that points the server to the device that it was looking at in DDE, ours is "Channel_1.Device_1".
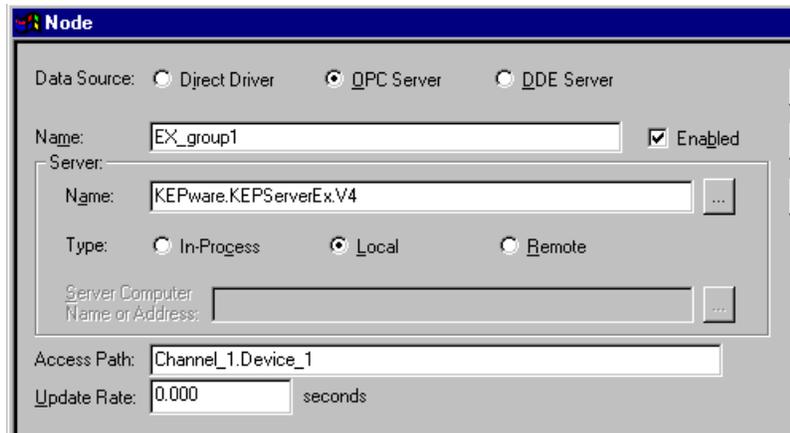


6. Click Accept to accept the changes to the node and then close the Node dialog.

7. You should now be able to save and run the project.

## Converting From Kepserver Advanced DDE to KepserverEx Advanced DDE

1. Although we highly recommend the performance gains of OPC over DDE, in some cases you may want to convert to the new server but not use OPC. In that case you should follow steps 1-7 in "Converting from Kepserver OPC to KepserverEx OPC".

2. It is very important to convert the project because the new server does DDE differently then the old one did. In the Old Server you connected to each device individually as a

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topic.  In the new server there is one topic "_ddedata" and all items are accessed via the placing the full path in front of the actual item.  For example Tag_1 on Device 1 would look like this "Channel_1.Device_1.Tag_1".

3.  To make it easy we use the alias so that we do not have to change every item address.

4.  You should now be able to save and run the project.

# 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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