

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

KepserverEx Client Connectivity Guide

For Siemen's WinCC



KTSM-00008

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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 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 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.

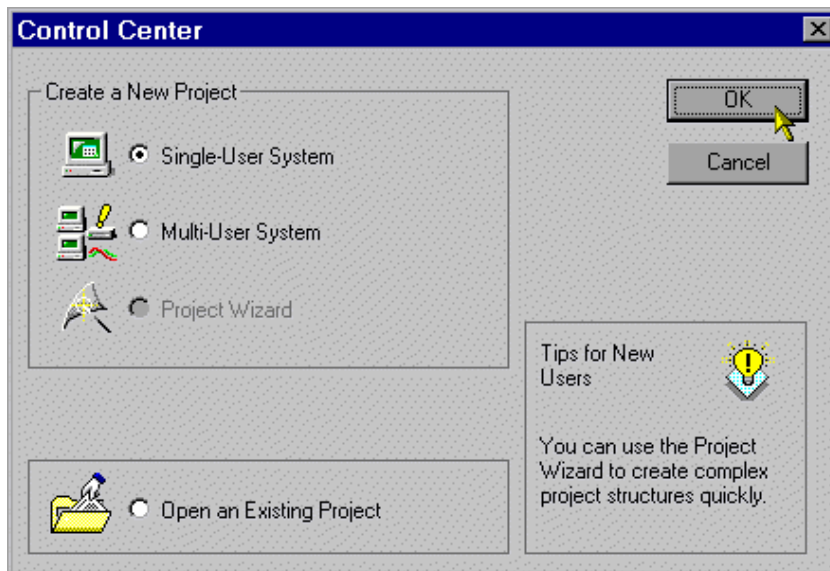
Siemens' WinCC as an OPC Client

Connect to KepserverEx from WinCC

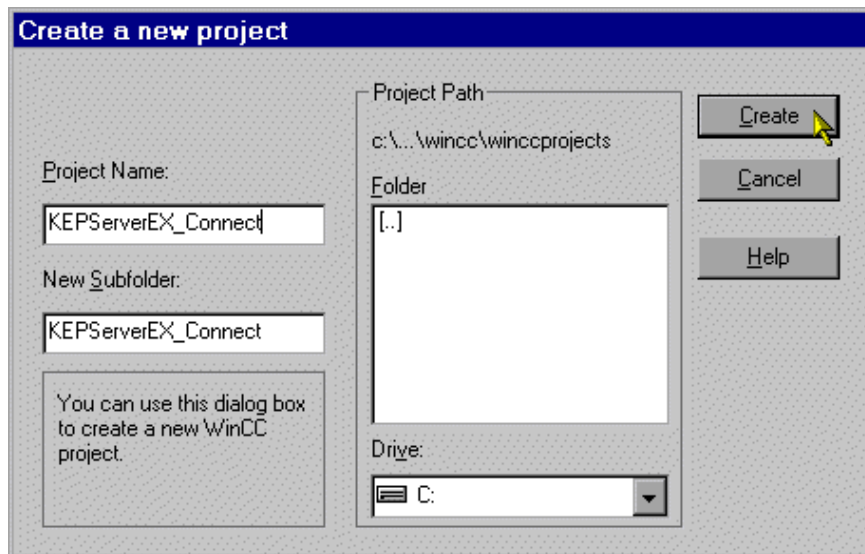
The following steps will show you how to create an OPC connection to the Server from WinCC.
Our example uses WinCC version 4.0.2.

Create a New WinCC Project

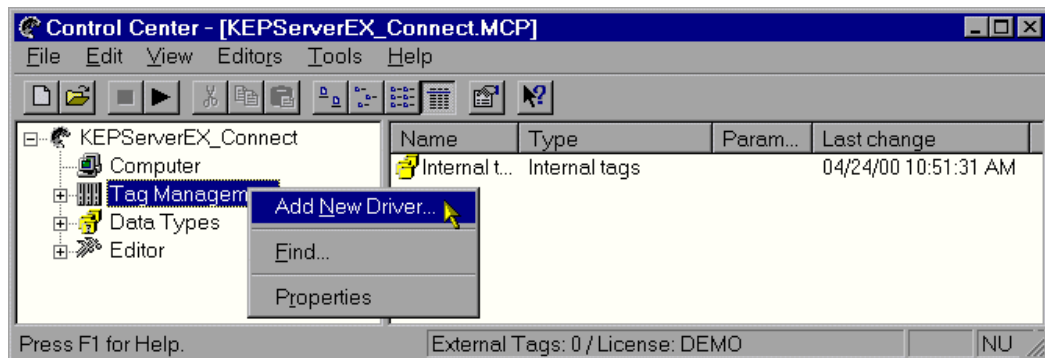
1. Start up the KepserverEx "Simdemo.opf" project.
2. Open your copy of WinCC to start a new project.
3. If there are no existing projects, the Create A New Project dialog will automatically appear, otherwise choose File from the Main Menu and New from the drop down.



4. For this example, select the Single-User System radio button and then OK.

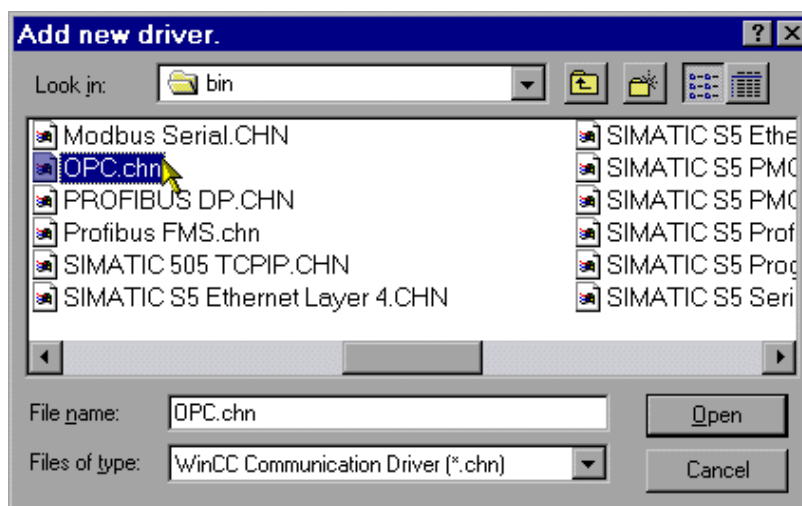


- The next step is to create a project name and directory path. Here, the Project and Subfolder are both named "KEPServerEx_Connect". Choose Create when finished.



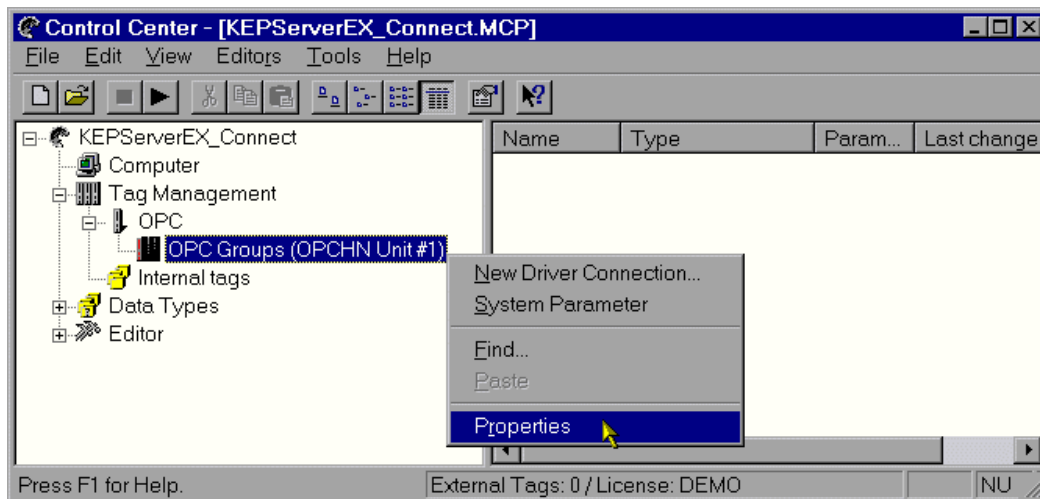
Add a Driver to the Project

- In the "tree view" of the main Control Center window, right click on the Tag Management module and select Add New Driver from the drop down menu.



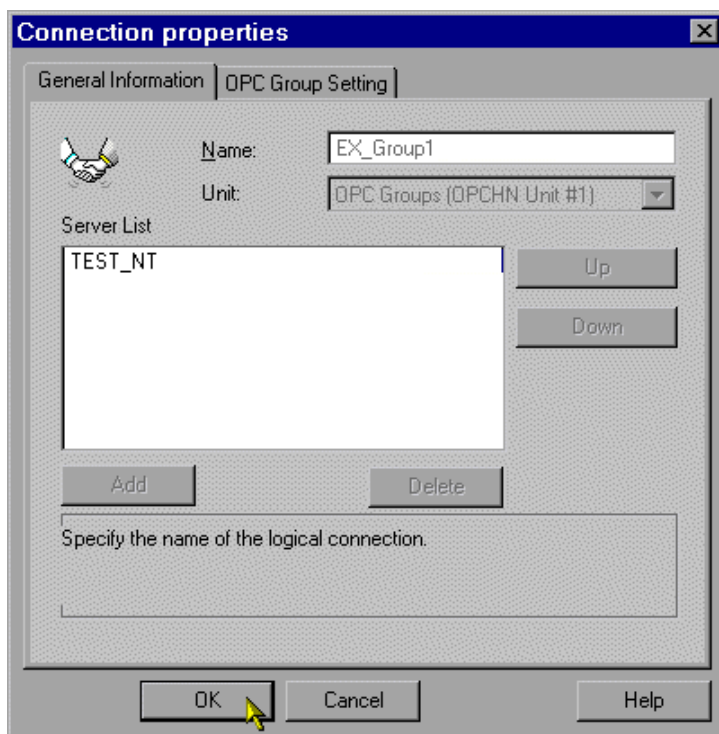
- Select the driver named "OPC.Chn" (OPC Channel) and choose Open.

- Next, right click on the newly created OPC Groups module available under Tag Management\OPC. Choose Properties from the right click menu.

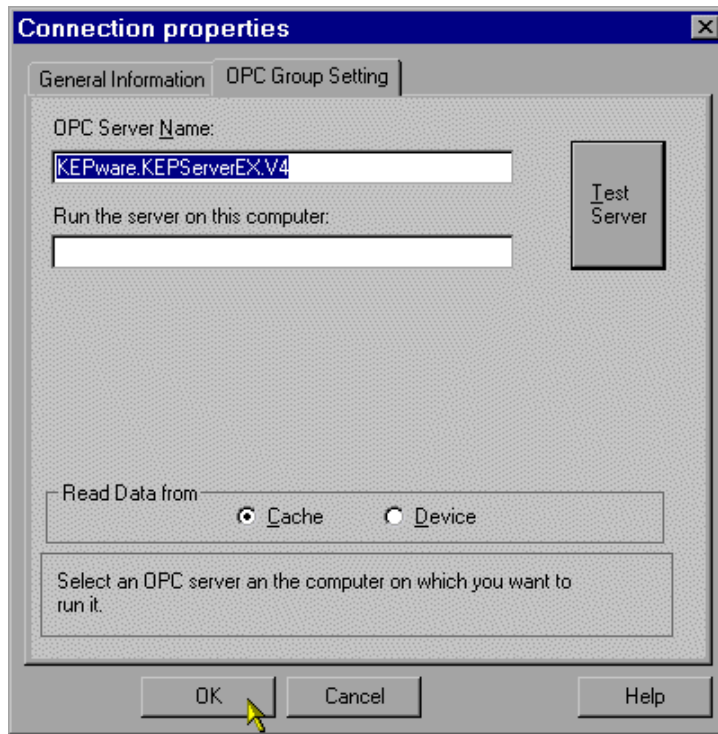


Create Driver/Group Connection

- Click on New... in the Channel Unit Properties window to get to the main Connection properties window.

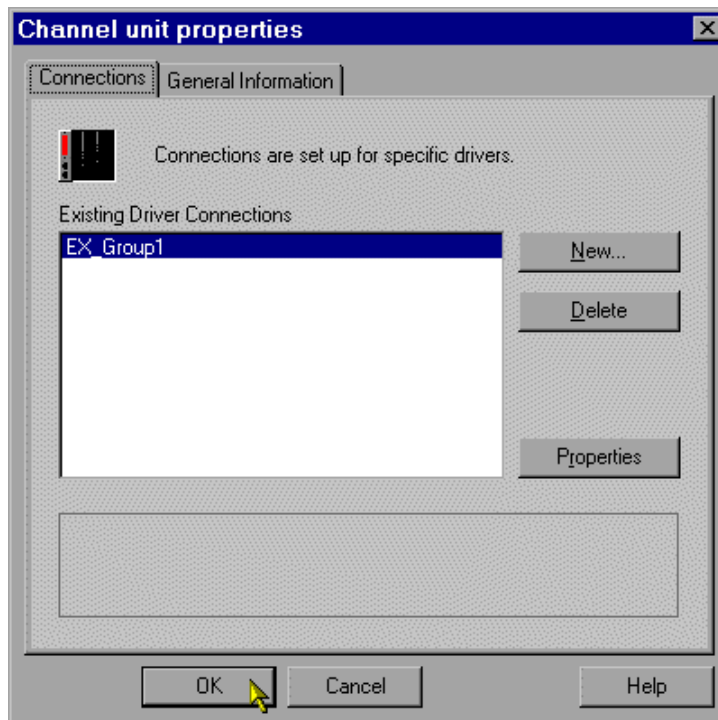


- In this example we have named the OPC connection as “Ex_Group1” while our computer name remains as “TEST_NT”. After appropriately filling in the General Information tab, click on the OPC Group Setting tab at the top of the dialog box.

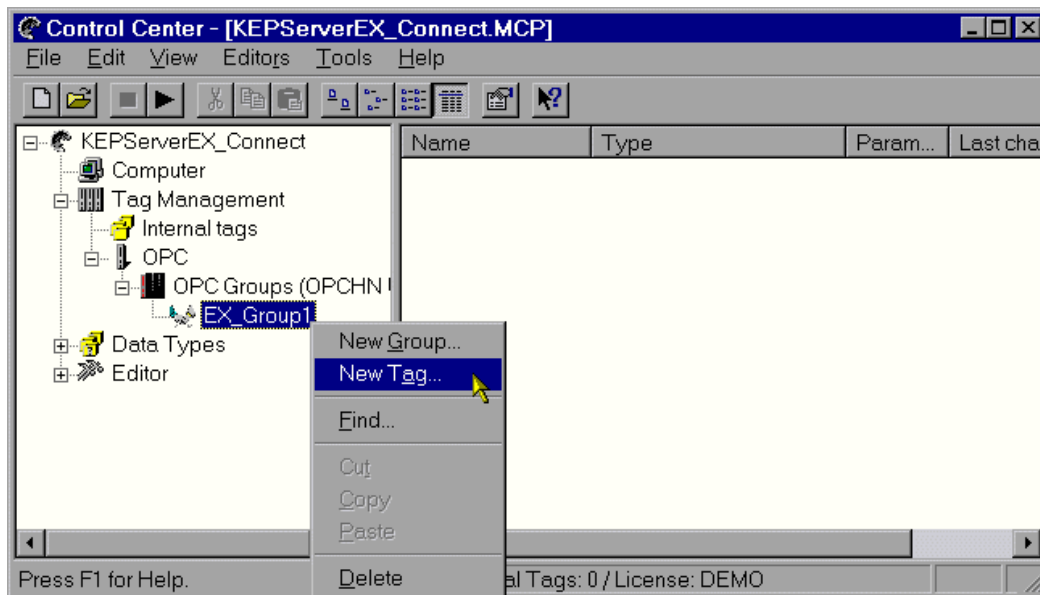


If the server test fails, check the OPC Server Name field to make sure it matches our example.

11. In the OPC Group Setting dialog, enter “KEPware.KEPServerEx.V4” as the OPC server name. Press the server test button to make sure that Control Center can properly invoke the server. Finally, choose which data source to receive data from (Cache is recommended). Click OK when done.

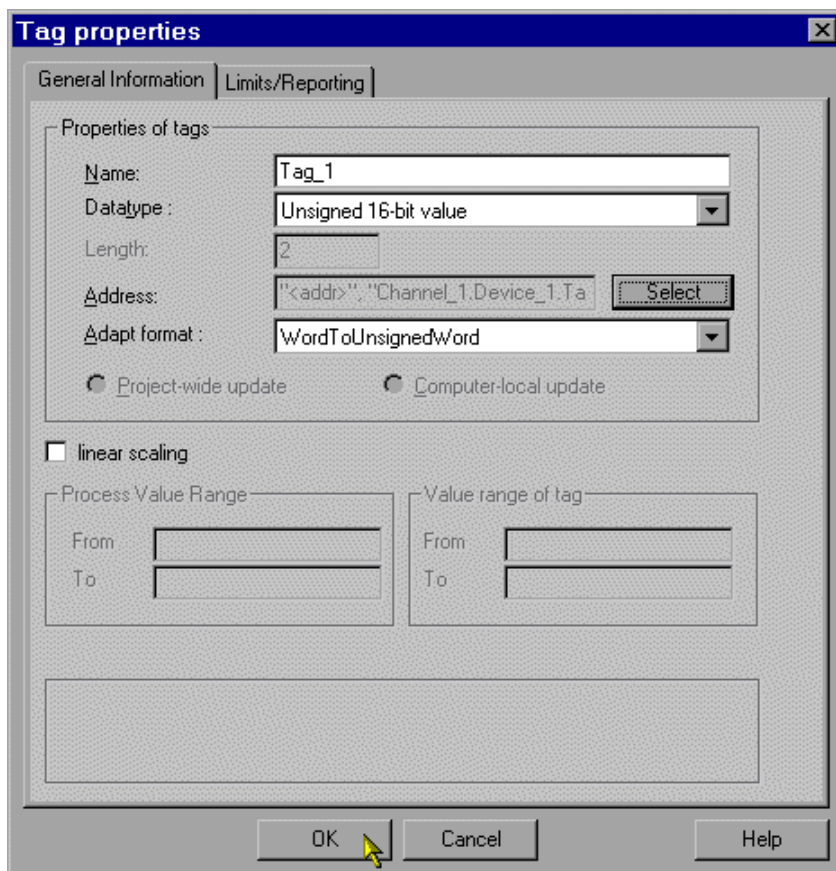


12. The Channel unit properties dialog box now contains the newly created OPC group connection. Click OK to continue.

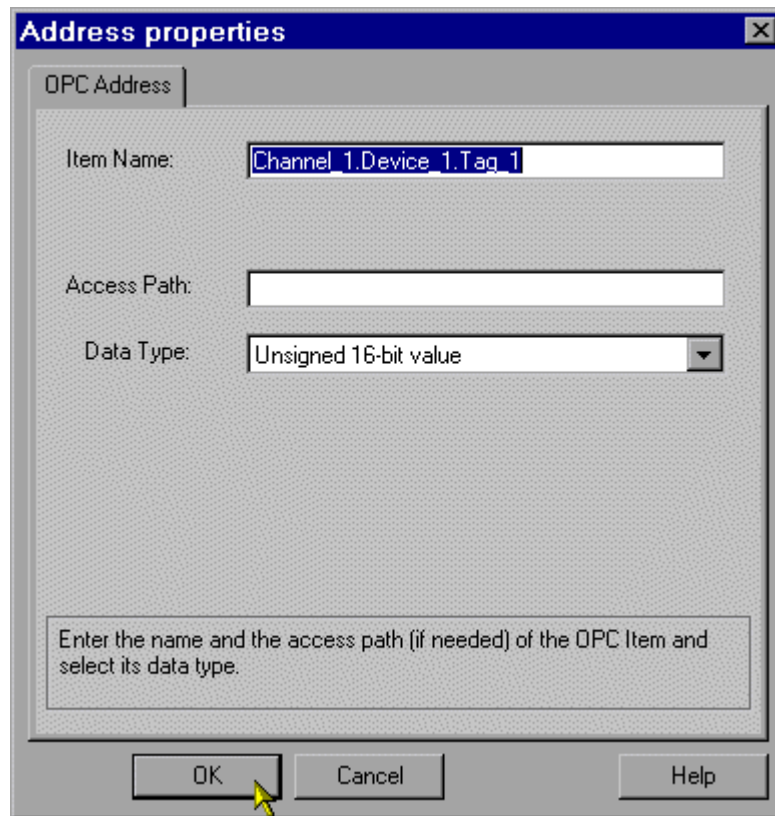


Create A Tag

13. The next step is to create a tag under the new OPC group. Right click on Ex_Group1 and choose New Tag... from the right click menu.

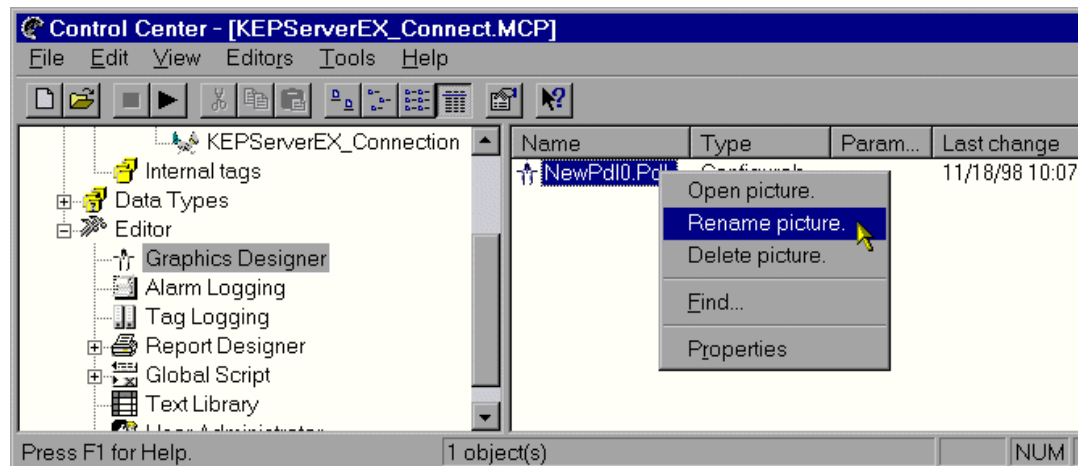


14. In this example we use an Item that has been predefined in KepserverEx (known as a User Defined Tag) called "Tag_1". Click the Select button to define a tag item.



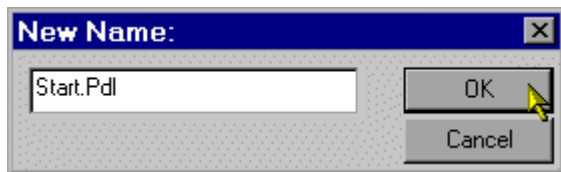
15. In the item name field, enter the address of the tag item. Also, choose the most appropriate Data type for the tag item and click OK.

Note: In the Item Name field, you may also ask for a dynamic tag by replacing the tag name with an actual address. e.g. Channel_1.Device_1.R001

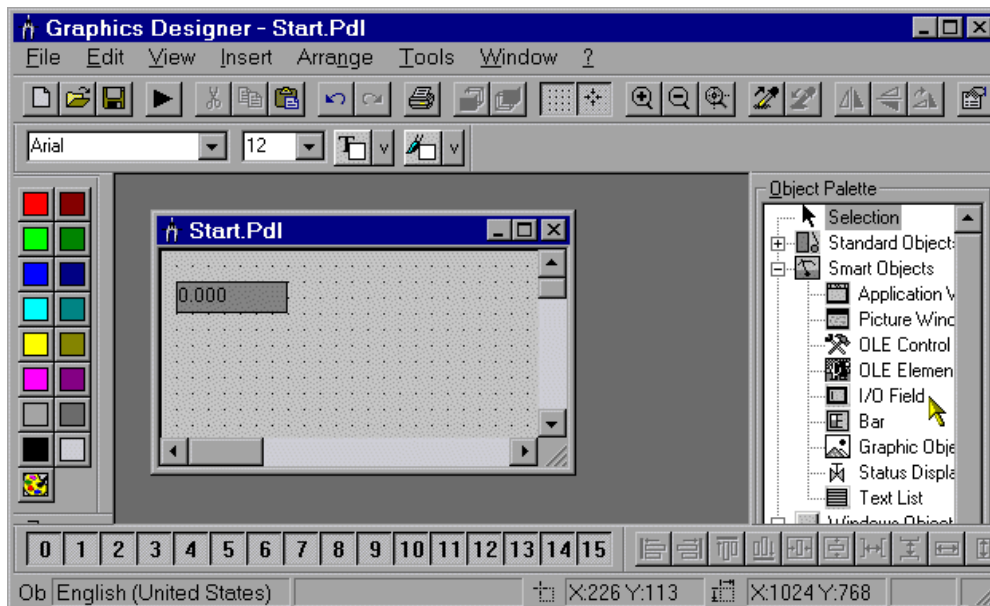


Create Graphic Display

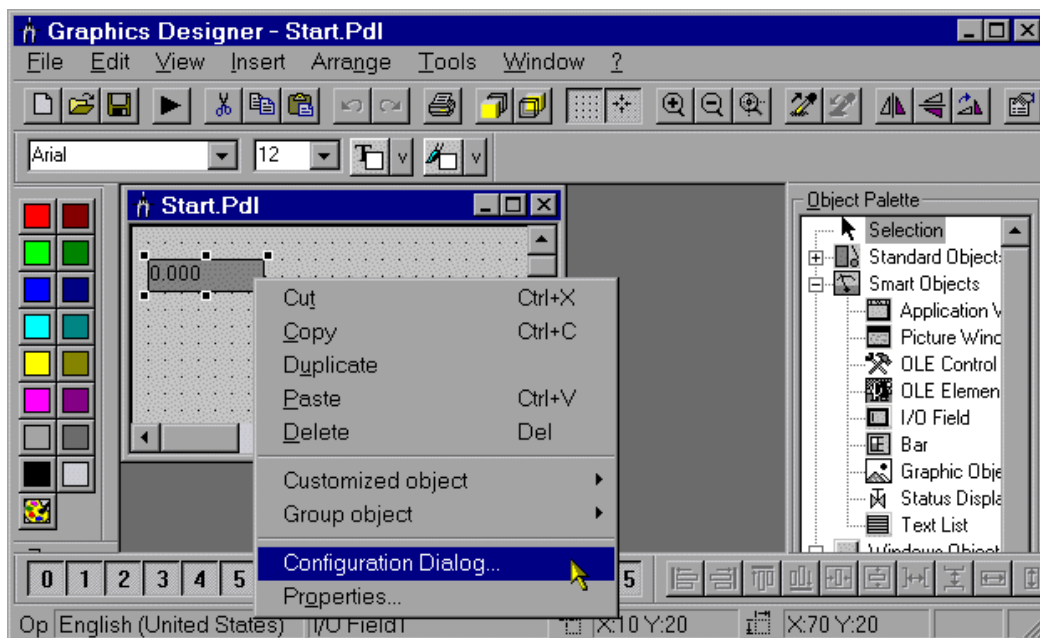
1. Now that a connection and tag have been defined, we must now create a graphic display of the tag item. Right click on Graphics Designer under Editor in the tree view. Open a picture and right click on that picture to rename it. Rename the picture to "Start.pdl", as this is looked for when WinCC executes runtime. Lastly, click on OK.



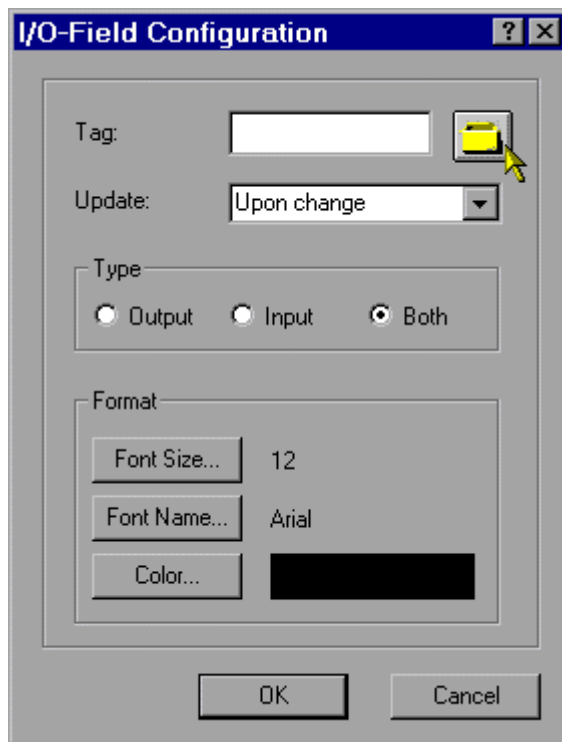
2. Now double-click on the picture's name to start up the Graphics Designer.




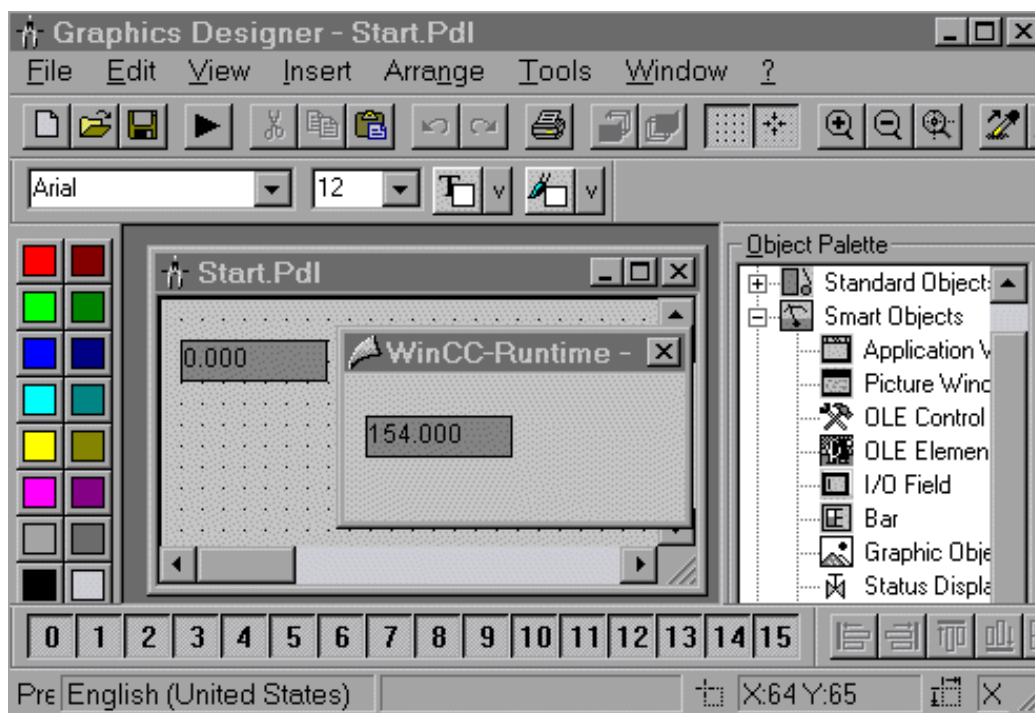
3. In the Graphic Design window, choose I/O Field object from the Object Palette. Next, right click on the picture window to create the I/O Field display object that will be used to display data during runtime in the window. In order for this display object to function correctly, there must be link created from the object to a defined tag item.




- Right click on the I/O Field object and choose Configuration Dialogue... from the right click menu.



- In the I/O – Field Configuration dialog, click on the Tag button  to select a tag in the Select Tag dialogue box. Once a tag has been chosen, click OK in each dialog box to exit to the main Graphics Designer screen.



View Data and Check the OPC Connection

6. The display object is now linked to a tag item. Tag data can now be displayed in runtime by pressing the Play button  on either the Graphics Designer or Control Center menu bar. As a quick test, check the Status Bar at the lower right edge of the KepserverEx window. You should see at least one Active Item.

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.