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

KepserverEx Client Connectivity Guide

For Lookout

KTSM-00015

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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 you can talk to it via the KepserverEx. If you do not connect to the device be sure to check the error messages and look up their meaning in the help file.

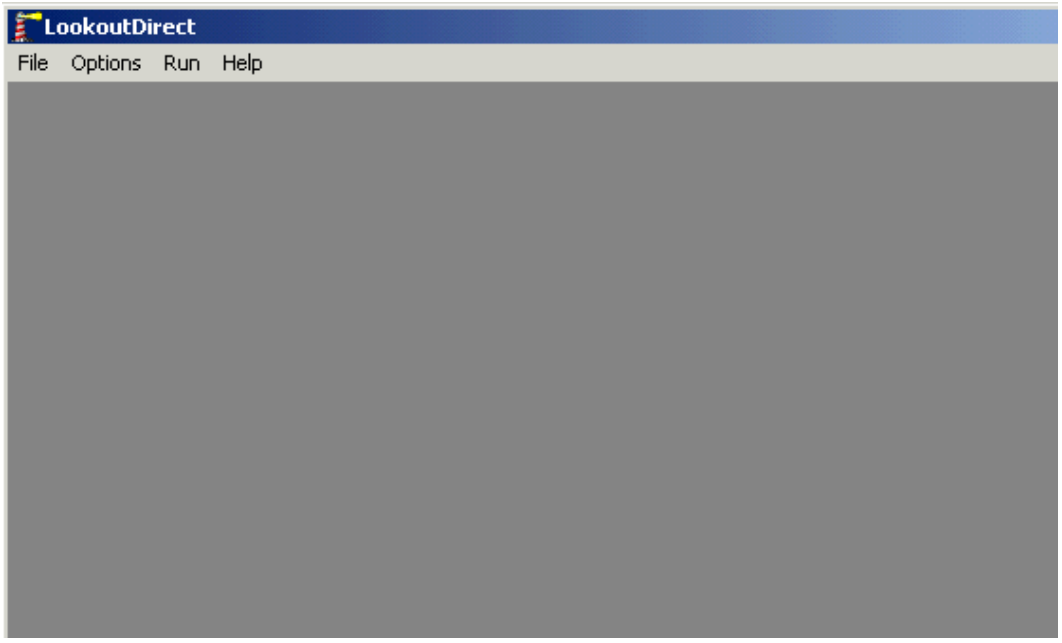
National Instruments Lookout™ as an OPC Client

Connect to the Server from Lookout™

National Instruments Lookout as an OPC client is one of many HMI's that can be used to connect to KepserverEx. The Lookout version used for this example was version *4.5.1 Build 18*. The following steps will show you how to create an OPC connection to the Server from Lookout.

KepserverEx is capable of being an OPC or DDE server to Lookout. If you define an OPCClient object in Lookout, then KepserverEx will be an OPC server to it. Likewise, if you define a DDE object in Lookout, KepserverEx will be a DDE server

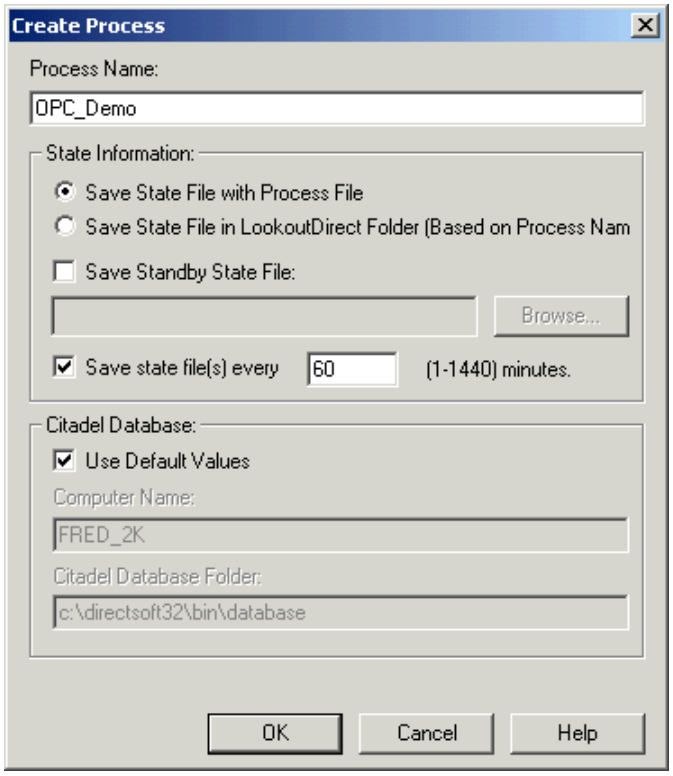
First you will need to open your copy of Lookout and click on File|New to start a new process in Lookout.



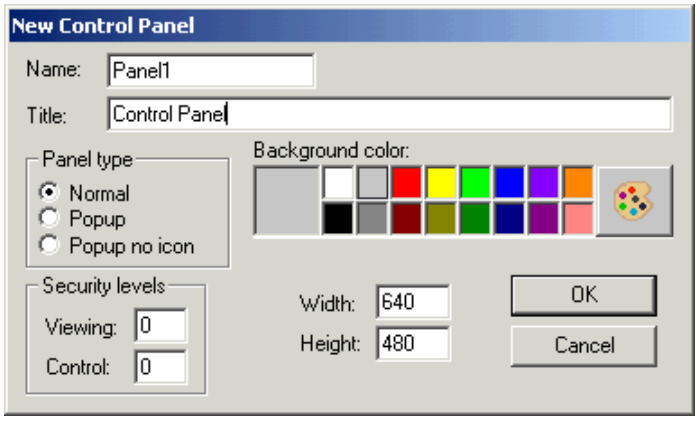
Create a New Process

You will now see a Create Process dialog box. Enter a name for your process in the Process Name field. We named ours "OPC_Demo" and accepted the defaults for the rest of the parameters. For more information on the other parameters in the Create Process dialog box see the Lookout Users manual.

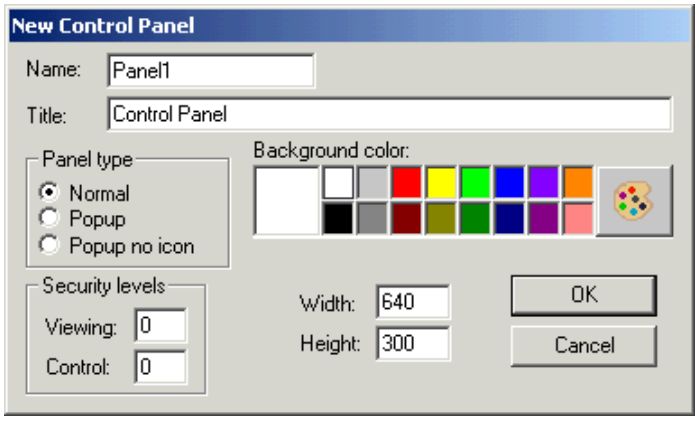
Lastly, click OK to finish.



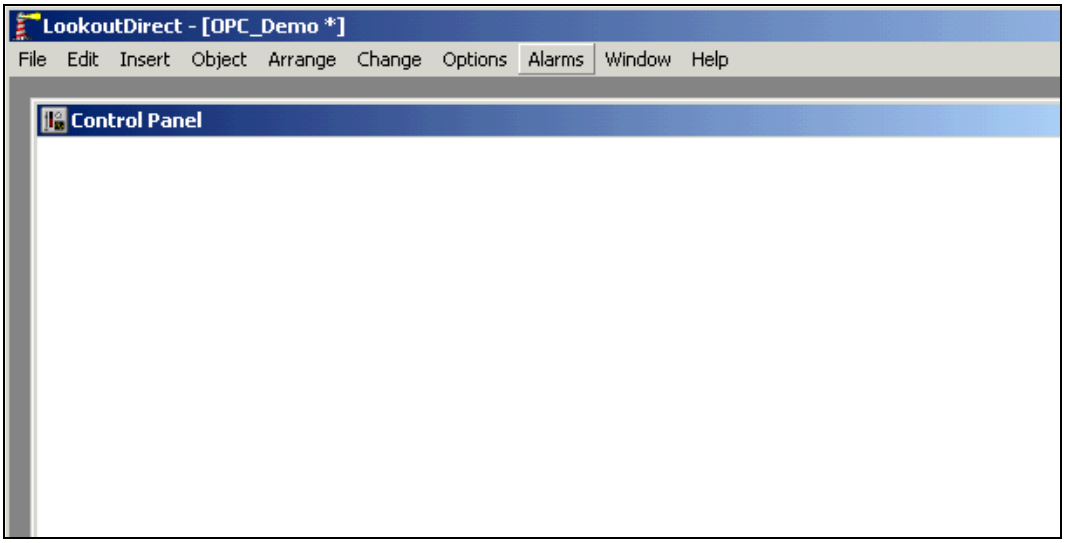
Next, Lookout will prompt you to create a new control Panel.



For instruction purposes you can accept the defaults. If you are not creating a full screen project you may wish to change the panel size, we changed ours to 640 by 300.

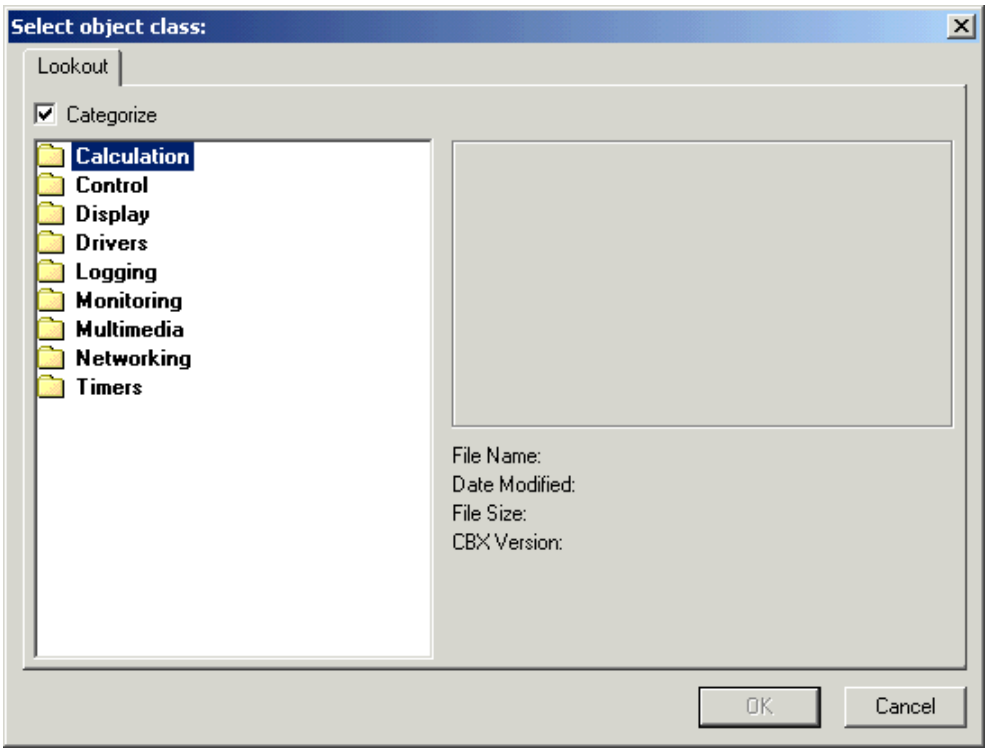


Click OK to accept the changes that were made to the panel and create it as an object in the process.

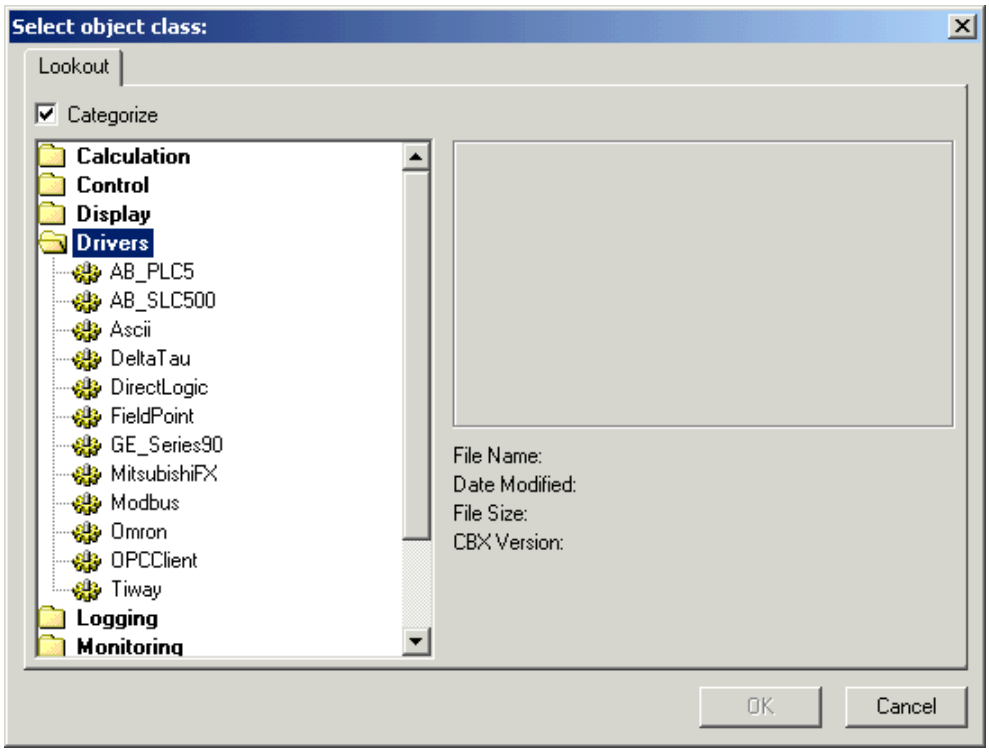


Create an OPCClient Object

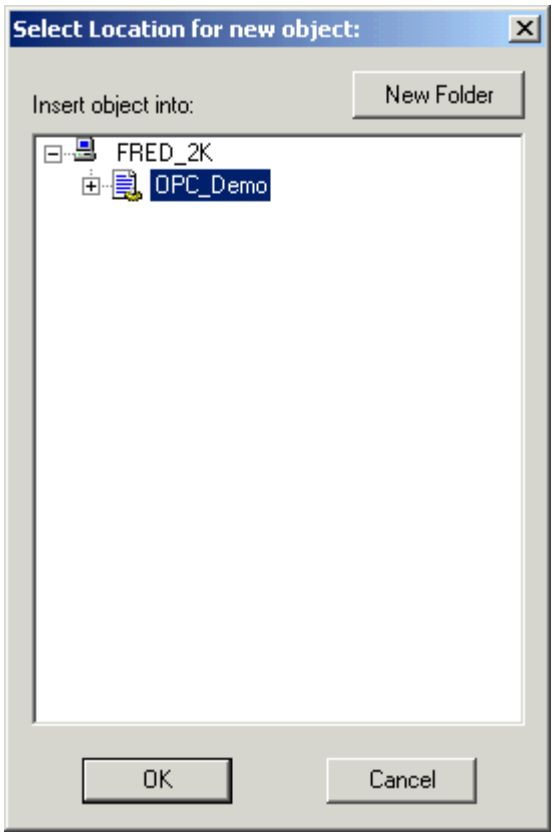
Now that you have a process started you will need to get data into it for display and control. To do this in Lookout you first need to create an object class to handle the communications between KepserverEx and Lookout. To do this select Object|Create... from the Lookout Main Menu.



In the Select Object Class dialog double click on the Drivers Folder and then select the OPCClient and click OK to accept it.

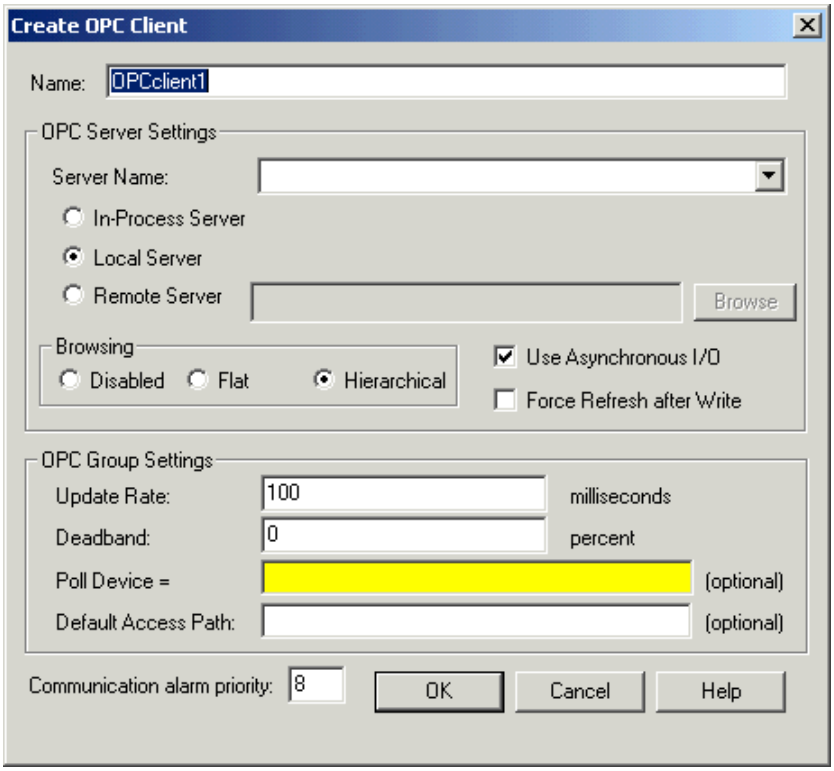


Next you will get a Select Location for new object dialog box. Select the process that you created earlier and then click OK to finish.



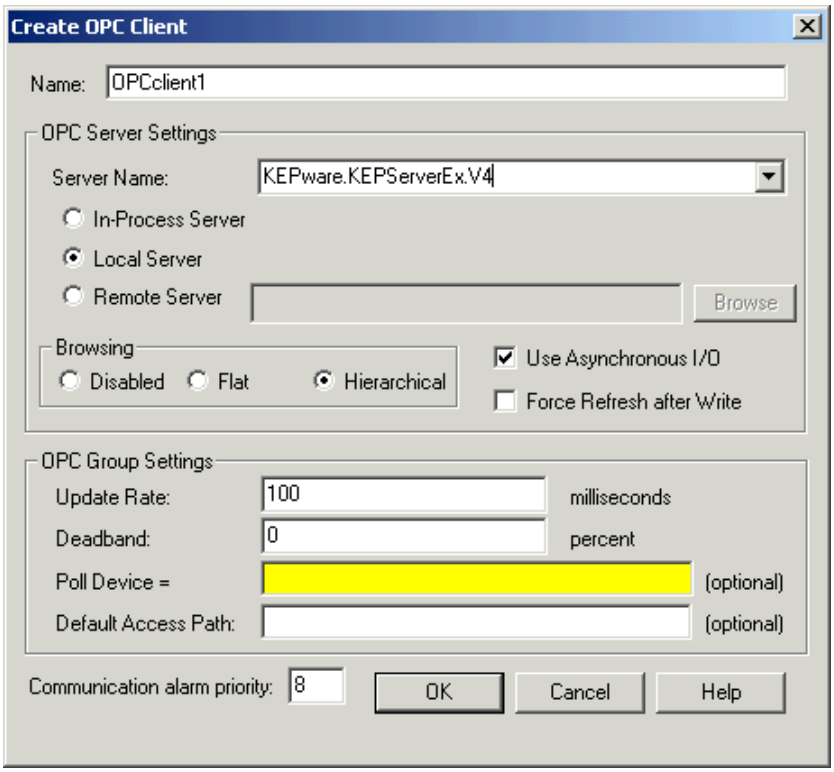
Now you will get a Create OPC Client dialog. You can accept the default Name or you can create your own. In the OPC Server Settings section you are going to use the drop down list to select

KepserverEx. If you have more then one OPC server installed on your PC the Server Name you will select is “KEPware.KEPServerEx.V4”.



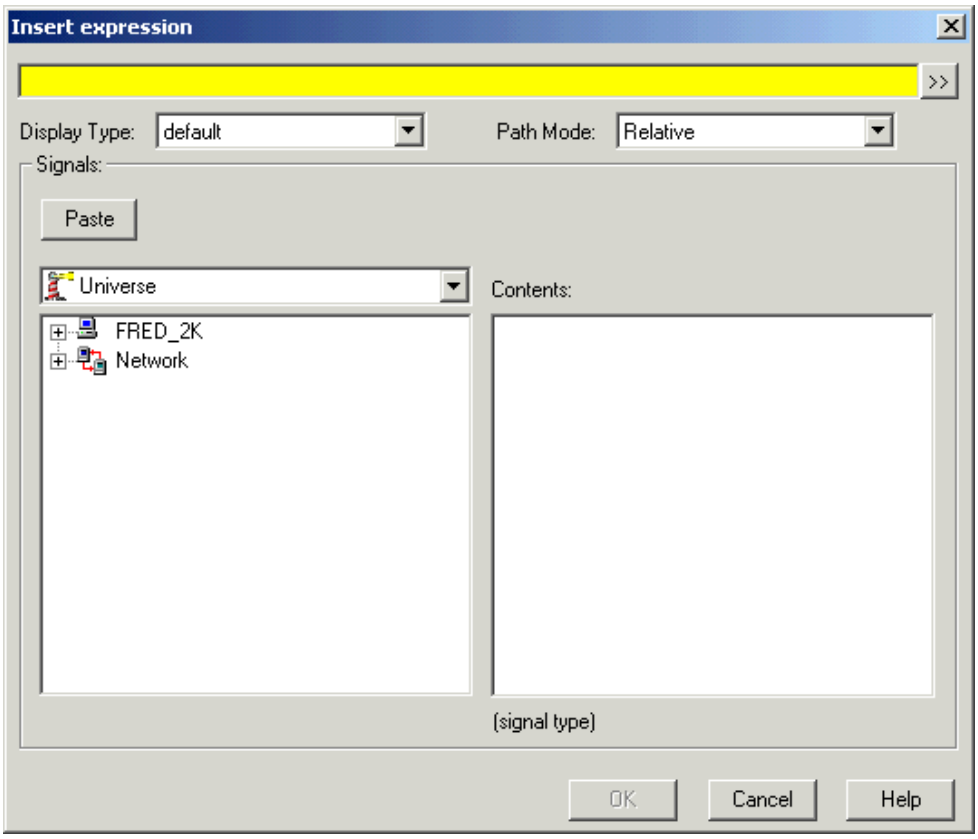
If you are going to connect toKepserverEx running on another PC then you would select the Remote Server radio button and type the name or IP address of the PC that is running the server. Unlike NetDDE connections you do not use backslashes in the name. You will also need to properly configure DCOM on all PC’s involved in the connection. For details on Configuring DCOM for KepserverEx see the DCOM configuration guide which is on your installation CD or available for download at www.kepware.com/support.

For now we will assume that you are connecting to a local server so you should be able to click on OK to accept the client settings. Look in your Lookout Help for an explanation of the other fields in the OPCClient dialog.



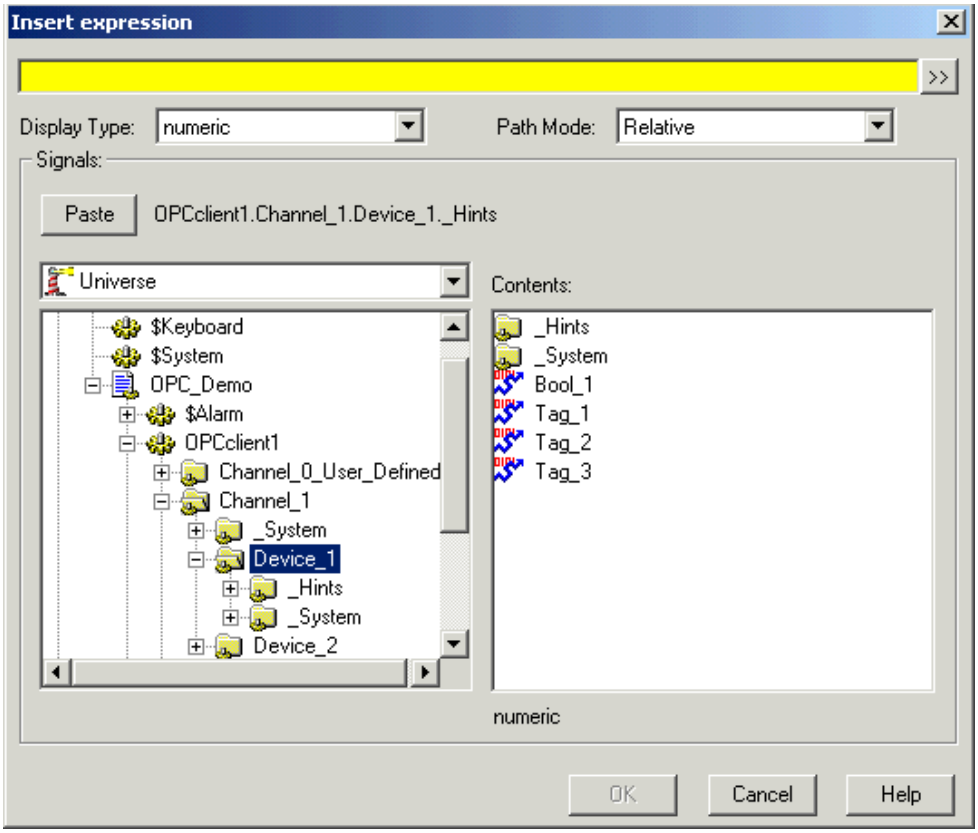
Add a Display Object to the Panel

Next, you need to display a value from the server in the Control Panel. To do this you will click on Insert|Expression... in the Lookout Main Menu.

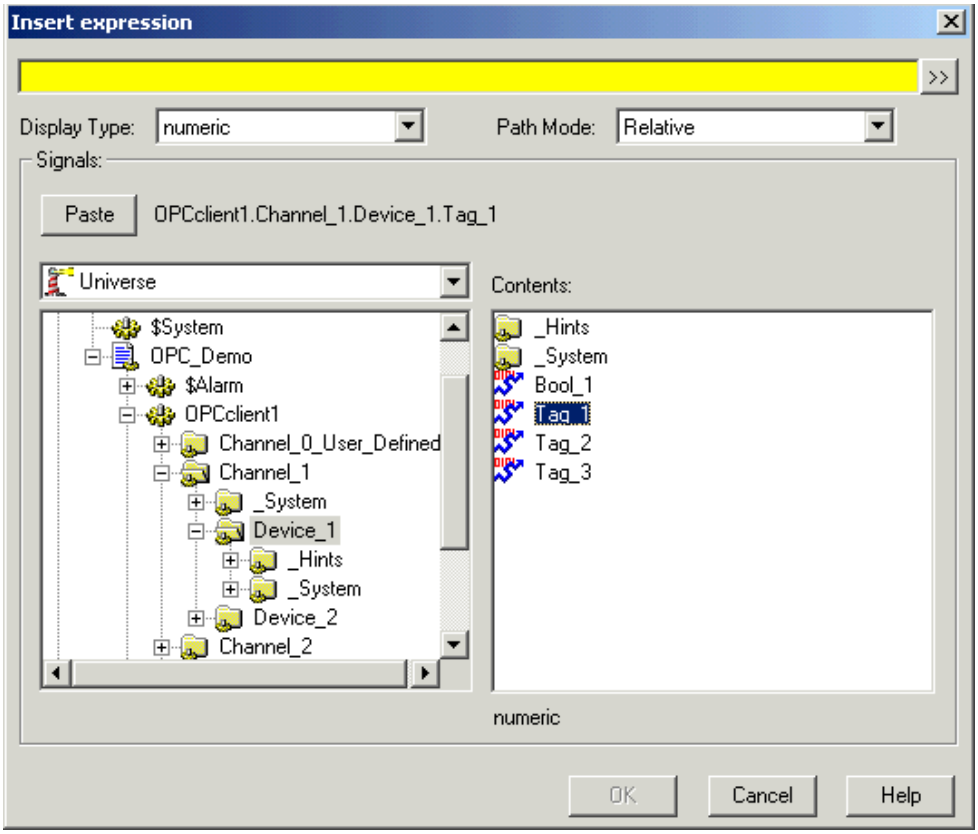


In the Signals section of the Insert Expression dialog you are going to expand the Objects in the left hand pane until you can see the folders under the OPCClient Object that you created. These folders are the Channels and Devices that were created in the KepserverEx project.

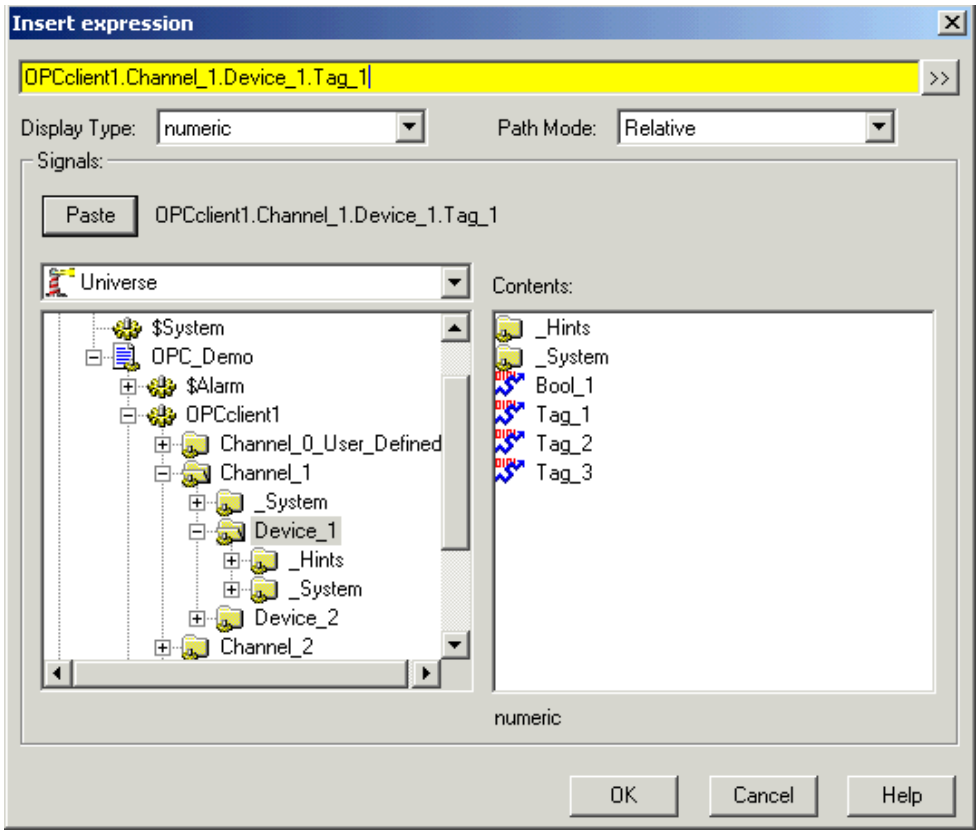
Select the Device Folder that contains the tag you wish to display in the control panel. In the Right Hand pane of the dialog you will see folders for internal tags specific to the device and you will see the tags that were added to the device in the KepserverEx.



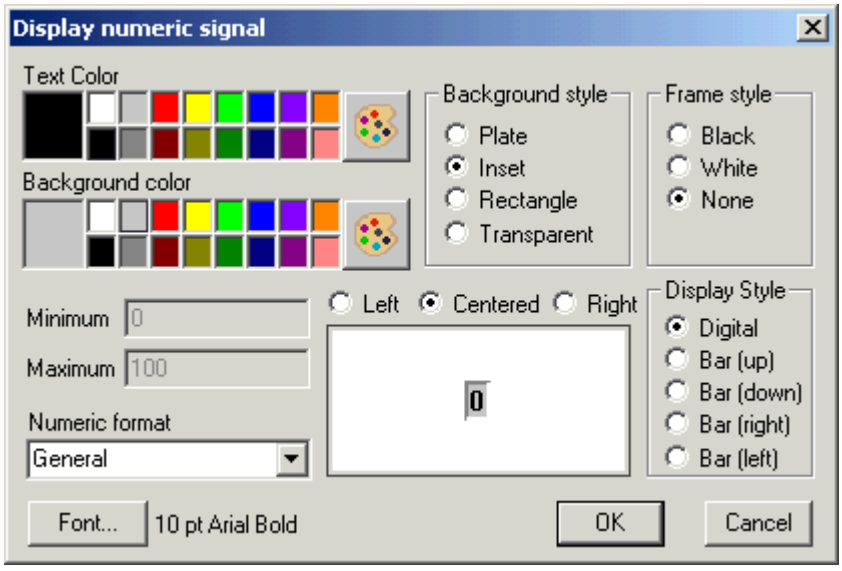
Select the tag you wish to display in the panel and click on the Paste button in the dialog to add the tag to the Expression field at the top of dialog box.



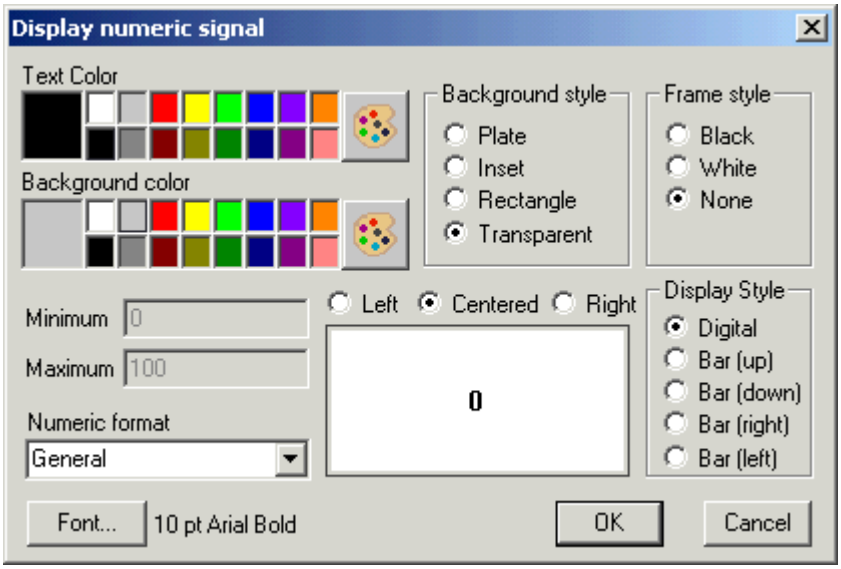
Click OK to accept the expression.



In the Display Numeric Signal dialog you will determine how the tag you selected will be displayed. In our example we select a tag that is a Word so we will accept the defaults except for the Background Style which we will change to Transparent.

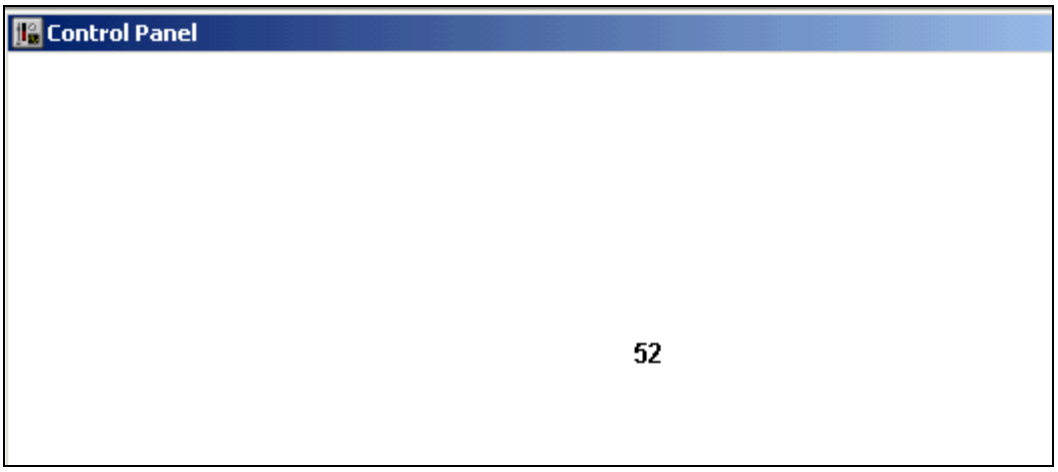


Click OK to accept.



View Live Data

At this time you should be seeing data displayed in the Control Panel.



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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