KepserverEx Client Connectivity Guide

For Cutler Hammer's PMPC Pro

KTSM-00007

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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 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.

Cutler-Hammer's PanelMate PC Pro as an OPC Client

About PanelMate PC Pro

Cutler-Hammer's PanelMate PC Pro OPC client is one of many clients that can be used to connect to KepserverEx. The PanelMate PC Pro OPC client version used for this example was version *1.10*. All PanelMate PC Pro versions 1.10 or greater support OPC client connectivity. The following steps will show you how to create an OPC connection to the Server from PanelMate PC Pro.

Creating a PanelMate PC Project

1. First, go to the Start menu folder for PanelMate and click on PanelMate Power Pro Software.
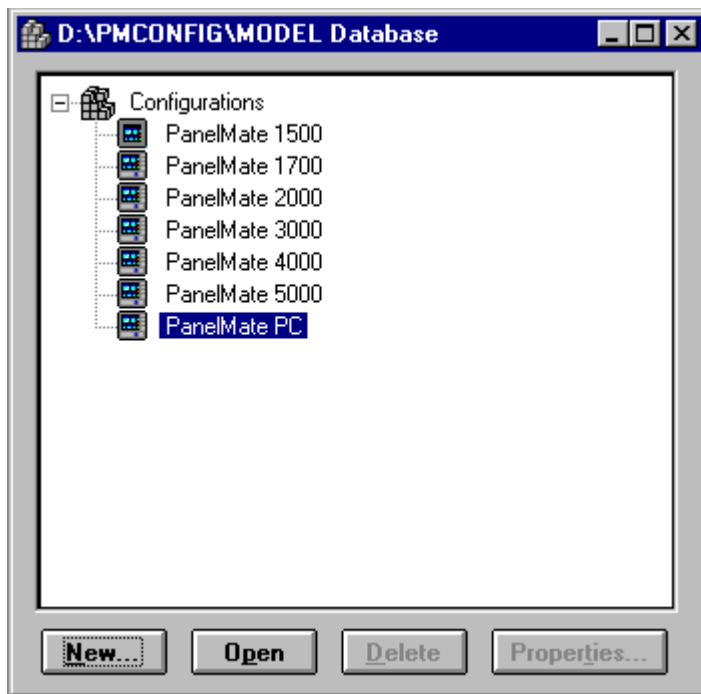
KepserverEx is capable of being an OPC or DDE server to PanelMate. If your node is defined as an OPC node in PanelMate, then KepserverEx will be an OPC server to PanelMate. Likewise, if the node is defined as a DDE node in PanelMate, KepserverEx will be an Advanced DDE server.

2. The PanelMate PC Configuration Editor will open with a default Database model Window.
3. Select the PanelMate PC icon and click the New… button.
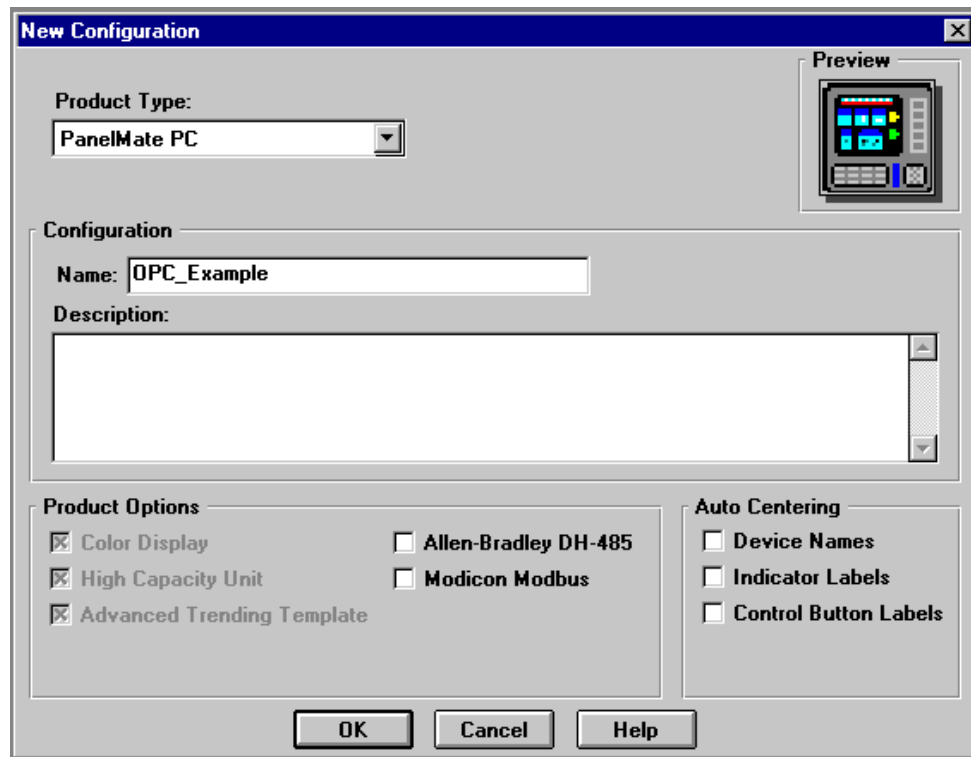
4. The Configuration Name is similar to a project name, so assign a unique name and click ok.
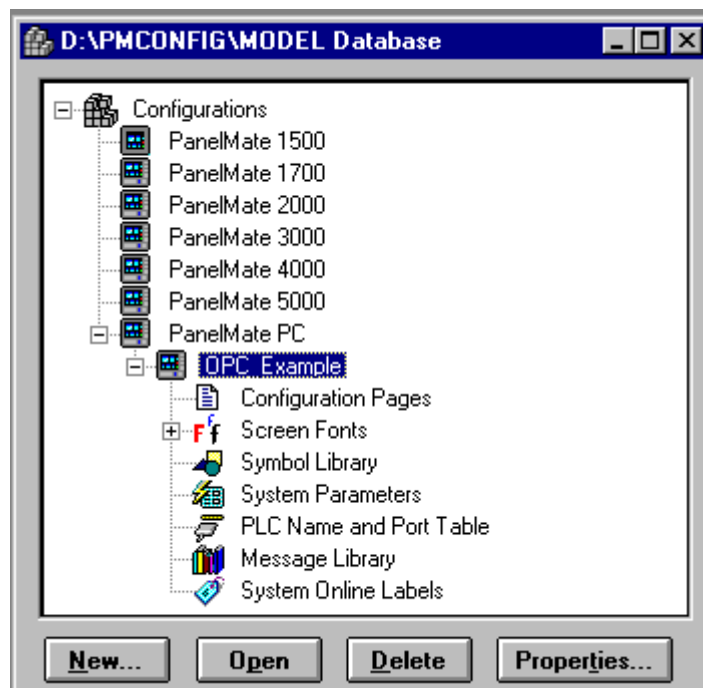
Create a Connection to the Server

5. Click on the + symbol to the left of the configuration name that you just created and drop down the tree view options. Double click on the PLC Name and Port Table option to open and edit the table.

6. Select OPC Server from the Device Use: drop down list located in the middle left side of the window.

7. Port 1 will be displayed as OPC Server in the Port Parameters list at the top of the window.

8. Next, click on the Add button to the middle right of the window. Item 1 will be PLC1 on port 1 in the PLC Name Parameters window.

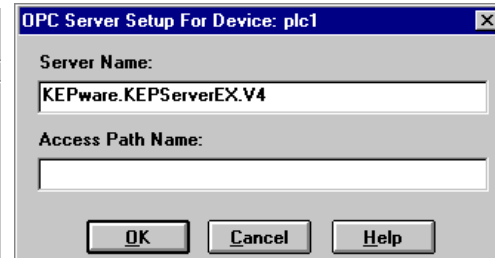9. Select Item 1in the PLC Name Parameter list and the OPC Setup button in the lower right will become available.
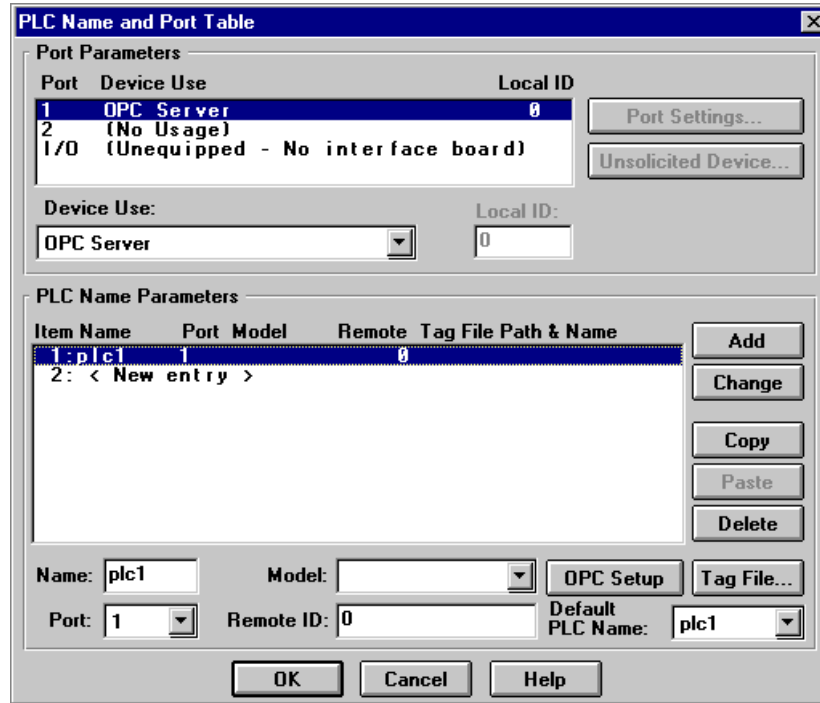
10. Click on the OPC Setup button and the OPC Server Setup window will open.

Settings 1:   **Settings 2:**

11. Enter "KEPware.KEPServerEx.V4" as the Server Name.

12. Next, if you are connecting to only one device from PanelMate then you can enter an Access Path for the device as we did in Settings 1. As you can see the one we entered points to Device_1 on Channel_1.

13. If you prefer to assign the Access Path Name in your item references then you will want to leave the Access Path blank as we have done in Settings 2.

14. When you finish making the entries click <u>O</u>K to accept them. Then click OK again to close the PLC Name and Port Table window.

Configure a Display Page

15. To configure a window (page), select the Configuration Pages branch and then click on the New button. Give the page a name (Title) and accept the defaults by clicking the OK button. In this example we used a page title of "OPC Example".
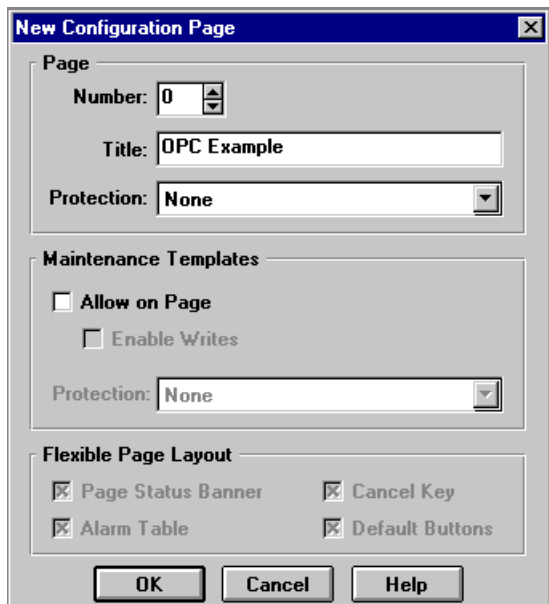
16. Next to open the page, double click on the new page that has appeared under Configuration Page in the tree view.

17. Click on the "VS Readout Template" button from the bottom middle of the Tool Box and place a template on your page.
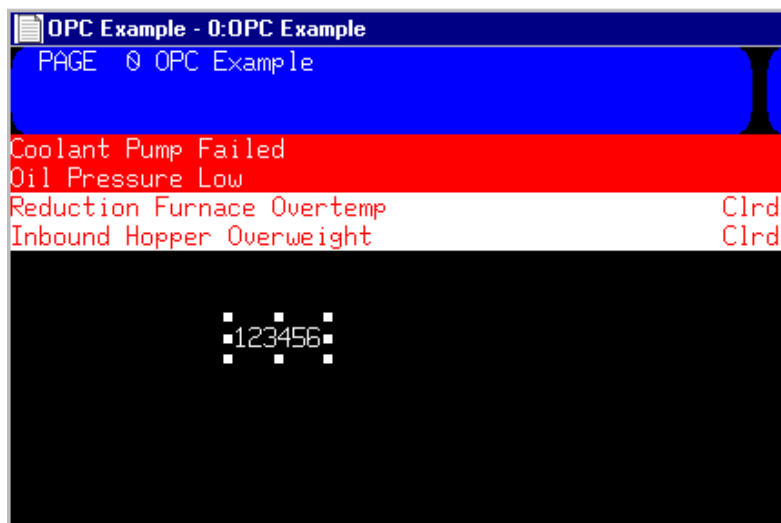
18. Double click on the template and enter a valid simulator tag in the Value: field of the Expressions tab. Make sure the item reference is surrounded by square brackets. If you entered an access path when setting up your server connection you would enter "[R0]" as the item.


19. If you left the access path field blank in the OPC Server setup (step 11) then you would enter the item as "[Channel_1.Device_1.R0]".

In both examples we are adding tags to the server dynamically by asking for data addresses that exist without having been defined in the device in the server project. This is fine if you wish to work with the default data type for that address. In our example the tag would be created as a word (also known as a 16bit unsigned integer). Please refer to the Addressing section of your KepserverEx driver help file for more information on default data types. Tags that do not use the default data type must be defined in the server first to set the appropriate data type. For example, if you needed to look at the R8 register of the Simulator as a float, you would need to define a tag in the KepserverEx and give it an address of R8 and a data type of float. If you had given this User Defined tag a name of "float8" then that is what you would use for your tag reference in PanelMate PC Pro. For more information on User Defined tags please refer to the "Designing a KepserverEx Project" section of the KepserverEx|Help|Contents selection.

20. To reference User Defined tags the format would be "[Tag_1]" or "[Channel_1.Device_1.Tag_1]. Remember, Tag_1 is a tag that was created in the server Simdemo project already.

21. .Now click OK to accept the expression you have entered.

22. Next, double click on the System Parameters branch.
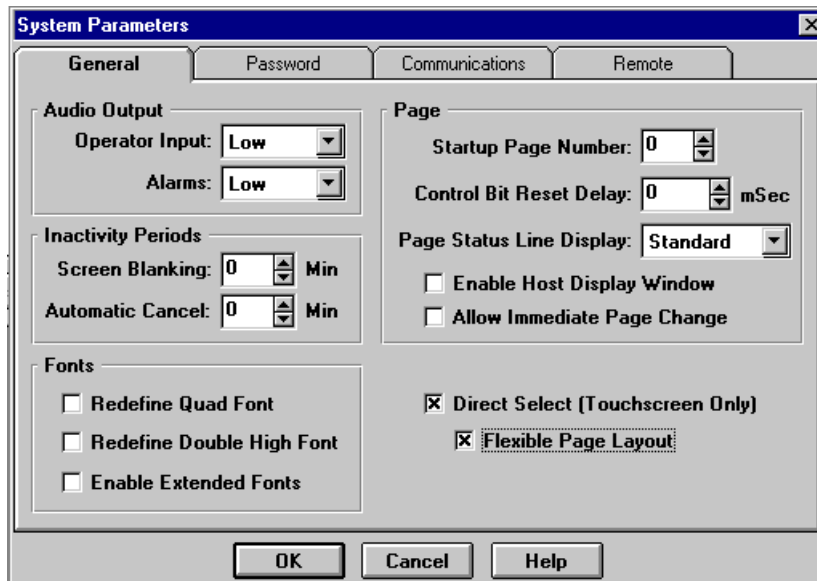
23. In the lower right place a check in the boxes for the Direct Select and Flexible Page Layout options then click OK to accept the parameters.

Save your configuration

24. Save your configuration by selecting the Configuration Name branch that resides under the PanelMate PC icon, then go to the File menu and select Save. It will save the configuration with the name you entered when creating this project earlier.

Run your PanelMate PC Pro Project

1. To run a PanelMate PC Pro project you need to export your configuration as a .PPS file. From the file menu select Export and give your PPS file a name (it is easiest to use the same name as was used for your configuration file). Note that although the PanelMate Configuration Editor runs under all Windows operating systems, PanelMate PC Pro requires either a Windows NT 4.0 or Windows 2000 runtime environment.

2. Save the .PPS file in the default directory (Pmconfig\Online\Cfg).

3. Make sure that the KEPserverEx SimDemo project is running, then from your windows explorer double click on your PPS file.
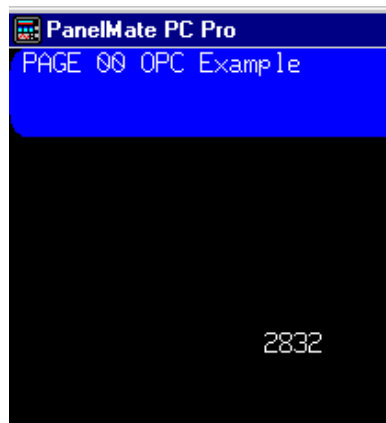
Using Kepware's OPC Quick Client

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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