Kepware Products for Windows $95^{\rm TM}$,98^{\rm TM}, 2000^{\rm TM}, NT^{\rm TM}, And XP^{\rm TM}

KepserverEx Client Connectivity Guide

For Kontron Czech Aspic 3.30



KTSM-00026

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32 Bit KepserverEx Connectivity Guide

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Table of Contents

INTRODUCTION TO KEPSERVEREX	1
ACCESSING KEPSERVEREX	1
USING KEPSERVEREX DRIVERS	2
KONTRON'S ASPIC 3.30 AS AN OPC CLIENT	3
CONNECT TO KEPSERVEREX FROM ASPIC 3.30	
Setup the Connection to the OPC Server	
Connection of OPC items from the OPC Server Connection of Variable to the Monitoring Object	
Switch to the Monitoring Mode and Check OPC Connection	
USING KEPWARE'S OPC QUICK CLIENT	13

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.

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.

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.

Kontron's ASPIC 3.30 as an OPC Client

Connect to KepserverEx from ASPIC 3.30

The following steps will show you how to create an OPC connection to the KepserverEx from the ASPIC 3.30. The ASPIC 3.30 version used in this example is *3.36.06.08*.

Setup the Connection to the OPC Server

- 1. Start Aspic 3.30 from the Start menu.
- 2. Select Setup/Setup Servers... from the menu. The Servers Setup dialog opens.

🔯 Aspic1 - ASPIC - [PAGE]			
🔜 File Edit Objects Mode View	Setup Tools Window		Help _ 🗗 🗙
	Options Edit Options Directories Time Sharing Setup Servers Access Rights System Access Edit Stations Edit Stations Edit Alarms Edit Math Value Scheduler Setup Sounds DataBase Archiving		
	Archive Retrieval Math		~
Set up data acquisition servers		416, 12	

3. Press the Add... button and enter the OPC Server name in the edit dialog.

:	
Cancel	

4. In the **Server type** section select the OPC Server.

5. Press the **Browse OPC Server...** button. Browse the list of installed OPC Servers and select the OPC Server you want to access OPC items from.

If the server is installed on another computer in a local network, browse the other computer. You need to set up DCOM for this remote connection.

If required, OPC Server supports the DA 1.0, and 2.0 OPC specifications. Choose the communication along **OPC 2.0**. Select the OPC Server from the list, and press **OK**.

OPC Server	×
🖃 🖳 My Computer	^
🕕 🚌 💼 OPC 1.0a by 1.0a	
庄 🗊 🗊 OPC 1.0a by 2.0	
📄 🖬 🖬 OPC 2.0	
KEPware.KEPServerEx.V4	
Matrikon.OPC.Simulation	
🚽 🖬 Matrikon.OPC.Simulation.1	
🚽 🖬 Merz.OPCAspicMP.1	
Merz.OPC_AB_DF1.1	
Merz.OPC_ADV_ADAM4000.1	
Merz.OPC_DDEToOPC.1	
Merz.OPC_GEFanuc90_SNPX.1	
Merz.OPC_Gen_Modbus_Jbus.1	
Merz.OPC_Gen_Modbus_Jbus_Slave.1	
Merz.OPC_KOYO_DirectNet.1	
# Merz.OPC_Lecom.1	
# Merz.OPC_MITS_MelsecFX.1	
# Merz.OPC_OLE_DB.1	
Merz.OPC OMR SYSMAC HOSTLINK.1	
merz.OPC SAIA S-BUS.1	
	~
KEPware Enhanced OPC/DDE Server: (6E6170F0-FF2D-11D2-8087-00105AA8F840)	
OK Cancel Refresh	

6. Now, you have the connection to OPC Server properly set. Press **OK** to confirm the setup.

Servers Setup			×
Data sources KEPServerEx SAIA ValueKeeper		Add Delete <u>R</u> ename	Server type Buffer DDE server C Common DDE server OPC server Number of variant sources:
Server definition Server <u>v</u> ariant: Varjant name:	0		twork Local Both
<u>S</u> erver: Class ID:		EPServerEx.V4 FF2D-11D2-8087-	Browse OPC Server
Uass ID: DDE Share: Description of t Station, Labels	he buffer serv	<u>I</u> opic:	Buffer, Labels 1,2:
ОК	Cancel		

Connection of OPC items from the OPC Server

1. Select **Setup/Edit Stations...** from the menu, or press button on the toolbar.

🔯 Aspic1 - ASPIC - [PAGE]	
🖼 File Edit Objects Mode View Setup Tools Window	Help _ 🗗 🗙
BI ABI BARRARRRARRRRRRRRRRRRR	□ 🖻 🕅
	<u> </u>
	≡
	~
Set up station configuration 273, 4	`

- 2. The Stations, buffers and variables setup dialog will open.
- 3. In the dialog, choose the type of new station according to the OPC Server's name (created in the 3rd step) and create the new station of this type by using the **Add...** button. Enter the new station's name in the edit dialog.

Stations, buffers and variables	setup
System description	System Setup Overview Sort Stations Select Type Num. of Stations: 0 Num. of Buffers: 0 O DBS Num. of variables: 0 Image: Comparison of the second sec
	New station Add _Memory Server (type) _Memory Server (type) _System Paste KEPServerEx SAIA ValueKeeper UK UK Cancel

- 4. In the tree structure, select the created station and its **Station Setup** tab.
- 5. Press the **Add Buffer** button and create a new data buffer.

Stations, buffers and variables setup			
System description	Station Setup Station Description KEPServerEx KEPServerEx Station Type: OPC Buffers: 0 Variables: 0 Variant: Name: KEPServerEx Server: KEPServerEx Server: KEPServerEx Server: KEPServerEx Server: KEPServerEx Variant: Server: Server: KEPServerEx Variables Add Buffer Paste Buffer Current Station Edit Copy Delete Cut Rename 		
•	OK Cancel Import Export Eind		

6. In the tree structure, select the created buffer and press the **Browse Variables** button in the **Data Buffers** tab.

Stations, buffers and variables setup				
System description	Data Buffers Sort Variables by Position Invalidate Variables if Comm Fail Never Immediately (System Time) In Time Safter Last Value Parameters Convert VT_BOOL Deadband Period ms			
<u>+;</u> E	OK Cancel Import Export Eind			

- 7. A dialog for browsing the OPC Server configuration opens.
- 8. The list of OPC items from the OPC Server configuration is located at the left side of the dialog. Double click on the name of OPC item to add it to the Aspic configuration.

🗄 🛅 _System	~	Aspic	OPC
Channel_1 Channel_1 System Device_1 Bool_1 Tag_1 Tag_2 Tag_3 Channel_1 System Hints	and the second se	Channel_1_Device_1_Bool_1 Channel_1_Device_1_Tag_1 Channel_1_Device_1_Tag_2 Channel_1_Device_1_Tag_3	Channel_1.Devi Channel_1.Devi Channel_1.Devi Channel_1.Devi
⊕ 🛅 Device_2 + 🛅 Channel 2	~		

9. Selected OPC items will be added to the Aspic application configuration and their **OPC Item** property will be automatically set to the proper value (due to the structure of the server's configuration – e.g. KEPServerEx: *channel_name.device_name.tag_name*).

Stations, buffers and variables setup	
System description Station Station Channel_1_Device_1_Bool_1 Channel_1_Device_1_Tag_1 Channel_1_Device_1_Tag_2 Channel_1_Device_1_Tag_3	Types Values Validity Limits 1 Limits 2 Access Archi ▲ Description Position & Type Internal Type Offset in Buffer: Bit: Internal Type Iype: String Time from Var.: Edit OPC Item Channel_1.Device_1.Boo System state type Cut Type Y Type Edit Rename Rename
	OK Cancel Import Export Eind

You have successfully connected the OPC items from the OPC Server to the Aspic program. Once the visualization has been started, the Aspic will start the OPC Server with the registered configuration, and it will start communications for the connected OPC items.

Connection of Variable to the Monitoring Object

1. Select **File/Open Library...** in the menu or press the **button** on the toolbar.

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🖼 File Edit Objects Mode View Setup Tools Window Help 🗕 🗗	×
2	
S	
Open a library file 302, 4	/1.

2. The standard dialog for selecting visual object library (*Aspic.alb*) will be displayed.

Open Libra	гу		? 🗙
Look in: 📔	Aspic330		* 🎫 🗸
Backup Licence Projects Archive			
File <u>n</u> ame:	Aspic.alb		<u>O</u> pen
Files of type:	ASPIC Library (*.alb)	•	Cancel

3. In the **Objects** dialog from the **Groups** pane, select **Active primitives** and then select the **Value** object in the Objects pane of dialog.

Objects	
Groups Active primitives	Objects Spin Button
Pasive primitives	State Bitmap State Color Step Button Step Button Step Button Switch Template Switch Template Switch Template Thermometer Value
OK Cancel	

4. A new object will appear in the top left corner of the monitoring page. Double-click the object, and connect the required variable in the **Variable** dialog.

Variables							
Channel_1_Device_1_Tag_1							
Name Comment Channel_1_Device_1_Bool_1 Channel_1_Device_1_Tag_1 Channel_1_Device_1_Tag_2 Channel_1_Device_1_Tag_3							
Variable: Channel_1_Device_1_Tag_1							
variable 0							
Show attribute: Value							
Other Properties Info Edit							
OK Cancel							

Switch to the Monitoring Mode and Check OPC Connection

1. You can switch into **Monitoring Mode** using the item **Mode/Monitoring** in the menu, or press the button on the toolbar.

🔯 Aspic1 - ASPIC - [PAGE]	
🖼 File Edit Objects Mode View Setup Tools Window Help 🗕 🗗	×
24 4 25 3 4 4 4 5 4 6 5 6 6 7 1 5 6 6 7 1	
0	
	B
	~
Switch the monitoring mode on/off 147, 1	_/_

2. Starting the **Monitoring mode** starts communications with the OPC Server. Active object shows current values of its variable.

🔯 Aspic1 - ASPIC - [PAGE]	
式 File Edit Mode View Setup Tools Window	Help - 🗗 🗙
3458	<u>^</u>
	~
For Help, press F1 0, 0 78, 44	11.

3. It is also possible to open a window for displaying of all variables and their properties. Select **View / Input/Overview...** in the menu.

🔯 Aspic1 - ASPIC	- [PAGE]			
🚟 File Edit Mode	View Setup Tools Window		_	Help _ 🗗 🗙
2 4 3	 ✓ Main Toolbar ✓ Status Bar 			
17565	Full Screen			<u>^</u>
	Zoom Setup Select zoomed Area Fit in Window Zoom Out Zoom In	Alt+ - Alt+ +		Ш
	Show Alarms New Graph Stop Annunciation of Changes Show Aspic Events Input/Overview Show AspicRep	Ctrl+E Ctrl+G		
Input of variables' value	es/Overview of variables' prope 319	9, 13]	1.

4. An **Input/Overview** dialog with all communicated variables will be opened.

Input/Over	view											
Date	Time	Name	Value	Phys. Unit	Quality	Comment	Туре	Station	Buffer	Offset	Bit	DDE/OPC Item
14.12.2004 14.12.2004 14.12.2004 14.12.2004 14.12.2004	15:10:54 15:14:05 15:14:05 15:14:05	Channel_1_Device_1_Bool_1 Channel_1_Device_1_Tag_1 Channel_1_Device_1_Tag_2 Channel_1_Device_1_Tag_3	15425 15425		Good, non specific Good, non specific Good, non specific Good, non specific		OPC OPC OPC OPC	Station Station Station Station	Buffer Buffer Buffer Buffer	0000 0000 0000 0000	0000 0000 0000 0000	Channel_1.Device_1.Bool_1 Channel_1.Device_1.Tag_1 Channel_1.Device_1.Tag_2 Channel_1.Device_1.Tag_3
Changes Output Cathering Discard Discard Items: All Into Clipboard V												
Refresh perioc 1000	: Sort by: Name	-	Selec	t columns	Hide							

5. At this time you have a good OPC connection to the KepserverEx. You should see a **Quality** of "Good" in the **Input/Overview** dialog for the tag, and a **Value** that is incrementing very quickly.

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.