

Kepware to TBox Ethernet Communications Setup





Description: This PCD Application Note will guide you through setting up basic Ethernet communications via ModBus TCP/IP Protocol between the KepServerEX Communications Engine and the TBox Family of RTU/PLC Products Solutions.

<u>Requirements</u>: KepServerEX Communications Engine (Version 5.4 or later) with the Modbus Protocol Suite installed. Semaphore TBox RTU/PLC with Ethernet Communications Configured.

<u>Assumptions</u>: It is assumed that you have familiarity with industrial devices and communications products and you have configured and can successfully communicate to the TBox RTU/PLC via Ethernet Communications with TWinSoft Programming Software.

<u>Notes:</u> All of the information provided is believed to be accurate and reliable; however, PCD assumes no responsibility for any errors. Further, PCD assumes no responsibility for the use of the information provided.

• Kepware, KepServerEX and their respective modules are trademarks of Kepware Technologies, Inc.

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Section 1 - Creating a new Channel

- 1. Open KEPServerEX Runtime and choose "New" from the file menu.
- 2. You will be prompted to replace the runtime project. Select "No" if you have a current configuration running then skip ahead to step 4.
- 3. If you wish to start with a new configuration file select "Yes, Update".
- 4. Click in the browser tree to add a channel or use the new channel button. The wizard will guide you through the channel setup.

🙆 KEPServerEX - Runtime	
File Edit View Tools Runtime H	lelp
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Click to add a channel.	

5. Enter a name and select next.

New Channel - Identification		22
	A channel name can be from 1 to 256 characters in length. Names can not contain periods, double quotations or start with an underscore. Channel name: TBox	
	< Back Next > Cancel	Help

6. Choose "Modbus TCP/IP Ethernet" from the drop down box and click next.

Select the device driver you want to assign to the channel. The drop-down list below contains the names of all the drivers that are installed on your system.	
Device driver: Modbus TCP/IP Ethemet	
 < Back Next > Cancel	Help

- Communication Serialization Leave these settings at default. Communication Serialization, specifies whether data transmissions should be limited to one channel at a time. For more information, refer to "Channel Properties - Advanced" in the server help file.
- 8. Network Interface This can be left at default. When left at default Kepware will let the operating decide what network adaptor to use.
- 9. Connection Behavior Default settings are fine.
- 10. Write Optimizations Default settings.
- 11. Non-Normalized Float Handling Default settings.
- Summary On the summary page you can review the settings before clicking finish. Use the back button to modify any settings.



Section 2- Add a device.

1. Click in the browser tree to add a new device or use the new device Button. The wizard will guide you through the device setup.

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Channels/Devices 🔻] 存 🛅 🎝 🖄 🖀 🤟 🔏 🖬 🖎 🗙 🔜
	Device Name 🗸 Model ID
Click to add a device.	Click to add a device.



2. Enter a name and select next.

New Device - Name	
	A device name can be from 1 to 256 characters in length. Names can not contain periods, double quotations or start with an underscore.
	Device name: TBox
	Back Next > Cancel Help

- 3. Device model Modbus (Default setting).
- Device ID This will be the IP Address of the TBox. The Default TBox IP Address is 192.168.1.99.

The device you are defining may be multidropped as part of a network of devices. In order to communicate with the device, it must be assigned a unique ID. Your documentation for the device may refer to this as a "Network ID" or "Network Address."
Device ID: 192.168.1.99

- 5. Scan Mode Default setting.
- 6. Timing All timing settings can be left at default.
- 7. Auto Demotion Click both checkboxes and leave the other settings at defaults.
- 8. Database Creation these settings will be left at defaults.
- 9. Ethernet These will be left at default unless you changed the port settings in the TBox.



- 10. Data Access Settings <u>Uncheck</u> the following:
 - "Use zero based addressing"
 - "Use Zero based bit addressing within registers".

New Device - Data Access S	ettings
	The driver can be configured with different settings for each device. Refer to the online help for assistance.
E SE	 Use zero based addressing Use zero based bit addressing within registers Use holding register bit mask writes
	 ✓ Use Modbus function 06 for single register writes ✓ Use Modbus function 05 for single coil writes
	< Back Next > Cancel Help

11. Data Encoding Settings – <u>Uncheck</u> "First word low in 32 bit data types".

The driver can be configured with different settings for each device.
Refer to the online help for assistance.
Use default Modbus byte order
First word low in 32 bit data types
First Dword low in 64 bit data types
Use Modicon bit ordering (bit 1 is MSB)

- 12. Variable Import Settings This will remain unchanged.
- 13. Error Handling Default settings.
- 14. Confirm your settings on the summary screen and click finish.





Section 3 - Add a tag

- 1. Click add a static tag to open the Tag Properties box.
- Name the tag and give it an address using standard Modbus addressing. For this exercise we will be using the Second tag from the TBox at Modbus register 422016. Click OK.

Tag Properties	×
General Scaling	
Identification	
Name: Second	
Address: 422016	<u>e</u>
Description:	×
Data properties	1
Data type: Default 💌	
Client access: Read/Write	
Scan rate: 100 💌 milliseconds	
Note: The scan rate is only used for client applications that do not specify a rate when referencing this tag (e.g., non-OPC clients)	
OK Cancel Apply	Help

3. Using the Quick Client you can test the communications to the tag you configured.

KEPServerEX - Runtime (Demo Expires (01:36:20)	
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B Box	Tag Name	Address
ТВох	Second	422016
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Ready	Default User Clients: 0	Active tags: 0 of 0

4. You should now see the Value change along with the second's clock in the TBox RTU/PLC.

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OPC Quick Client - Untitled *	A COLOR OF				
File Edit View Tools Help					
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□-:mi Kepware.KEPServerEX.V5	Item ID	🛆 🛛 Data Type	Value	Timestamp	Quality
DataLogger	TBox.TBox.Second	Word	20	15:55:37.839	Good
TBoxCommunicationSerialization					
TBoxStatistics					
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TBox.TBoxStatistics					
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