



# Kepware Technologies

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## Connecting to a Modbus Ethernet Device

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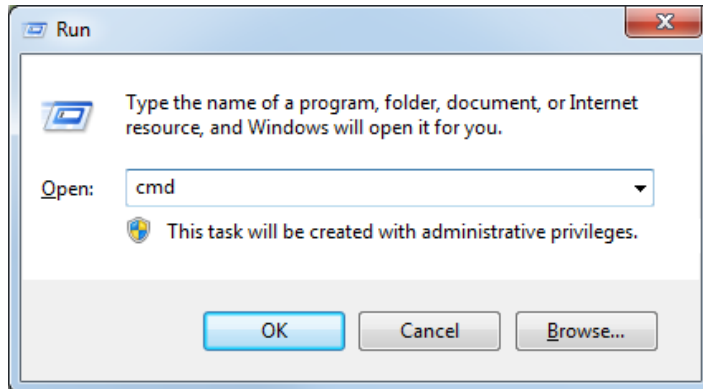
# 1. Introduction

This document describes how to connect to a Modbus Ethernet device through the KEPServerEX® communications platform.

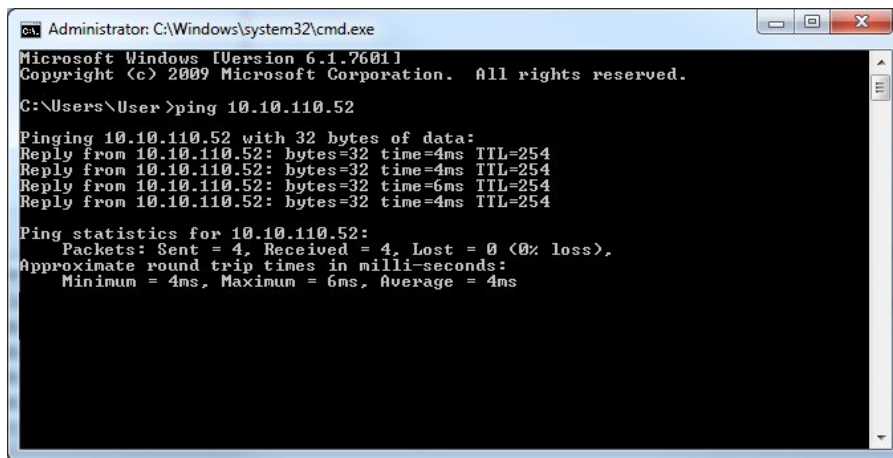
# 2. Testing the Connection to the Target Device

To verify that the target device is available for connection through a network “ping” in a command prompt, refer to the instructions below.

1. Click on the Windows **Start** button and open the **Run** dialog.
2. In the **Open:** text field, type “cmd”. Then, click **OK**.



3. When the command prompt opens, type “ping 10.10.110.52” where 10.10.110.52 is the IP address of the target device.
4. Once finished, press the **Enter** key. Watch the command window: there should be responses from the device if it is active and available on the network.



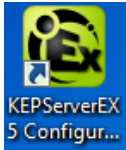
**Note:** This verifies a response from the designated IP address. It indicates that something on the network exists at that IP address and returns a response packet. This does not mean that the driver can connect every time, however. Furthermore, the lack of a response does not mean the driver will not connect; it may be that “ping” is disabled on the network or blocked by a firewall.

5. To close the command prompt, type “Exit” and press the **Enter** key.

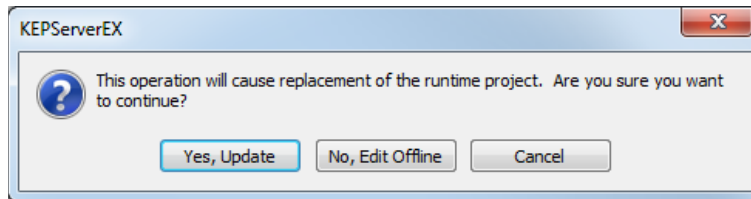
## 3. Connecting to the Modbus Ethernet Device

### 3.1 Adding a New Channel

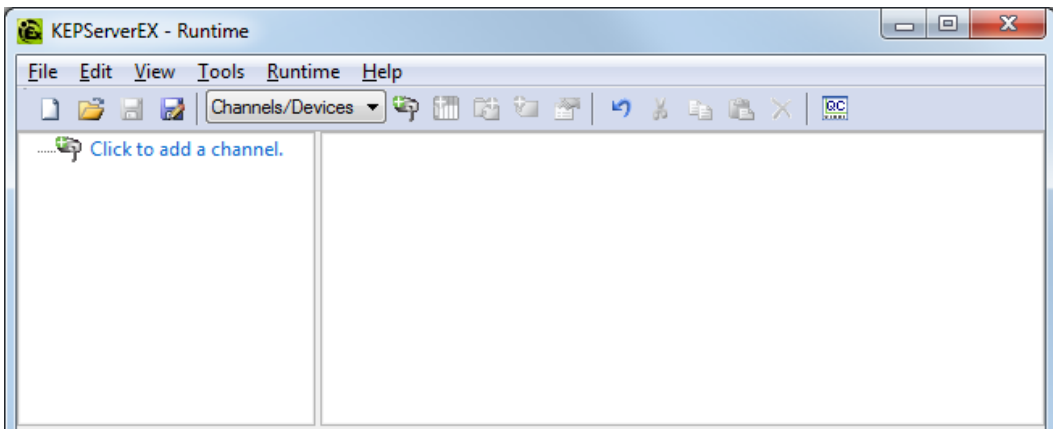
1. On the desktop, locate the **KEPServerEX 5 Configuration** icon and double-click to launch.



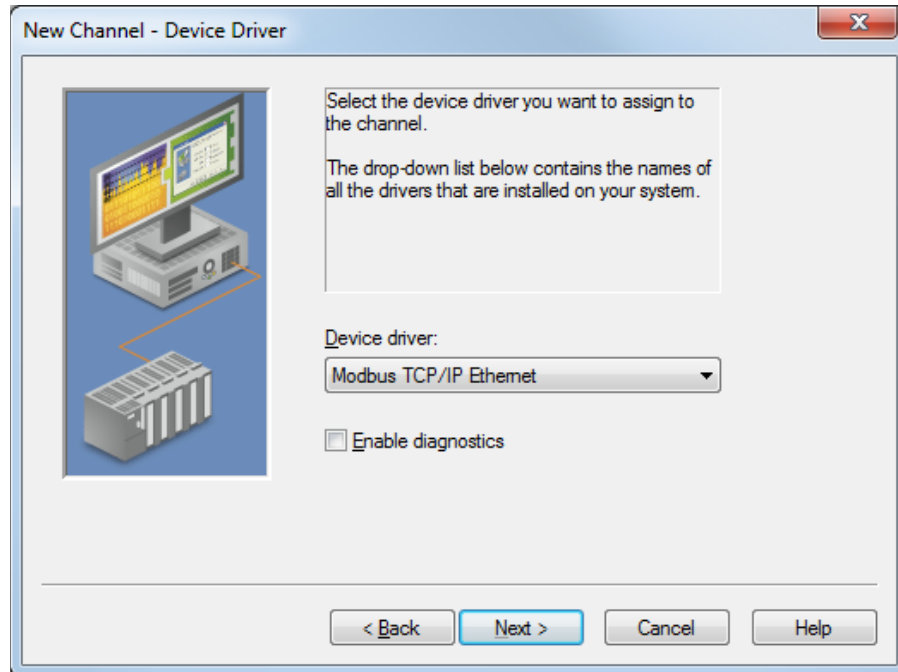
2. The application opens to a sample project titled "Simdemo.opf". To create a new project file, click **File | New**.
3. When prompted, select **Yes, Update** to replace the active project.



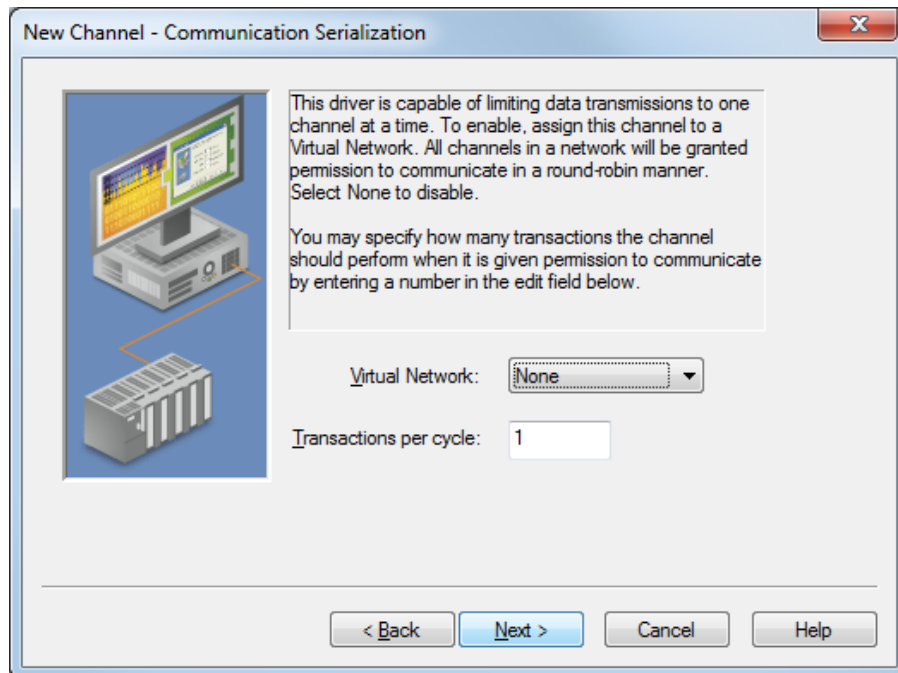
4. In Project View, select **Click to add a channel**.



5. In **Identification**, either rename the channel or leave it as "Channel1" and then click **Next**.
6. In **Device Driver**, select **Modbus TCP/IP Ethernet** from the drop-down list.
7. Leave **Enable diagnostics** unchecked and then click **Next**.

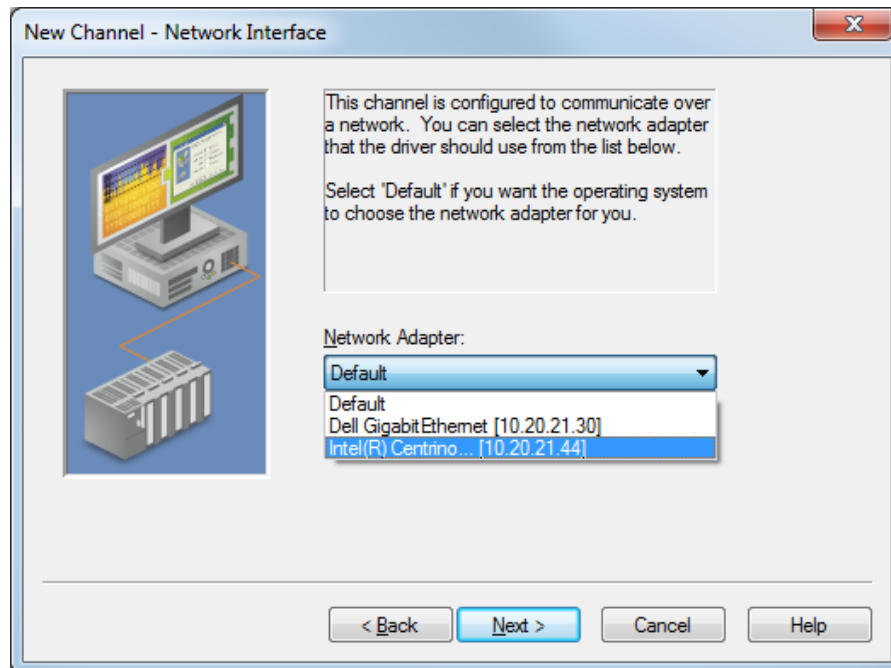


8. In **Communication Serialization**, leave **Virtual Network** at **None** and then click **Next**.



9. In **Network Interface**, select the specific network adapter to connect to this device. If there is only one adapter installed, select **Default**. Then, click **Next**.

**Note:** In this example, the local area connection is chosen.

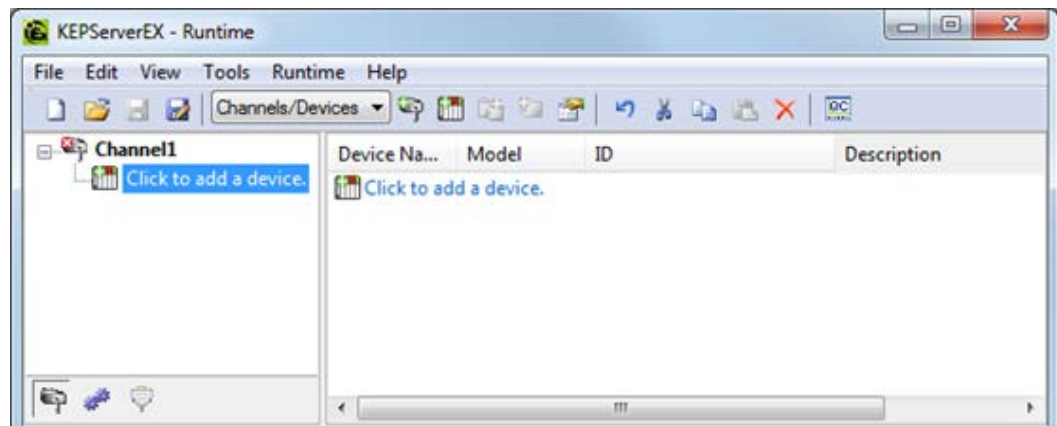


10. Continue through the New Channel wizard, selecting the default setting in each of the remaining dialogs by clicking **Next**. In **Summary**, click **Finish**.

**Note:** At this point, the new channel will be displayed in the project.

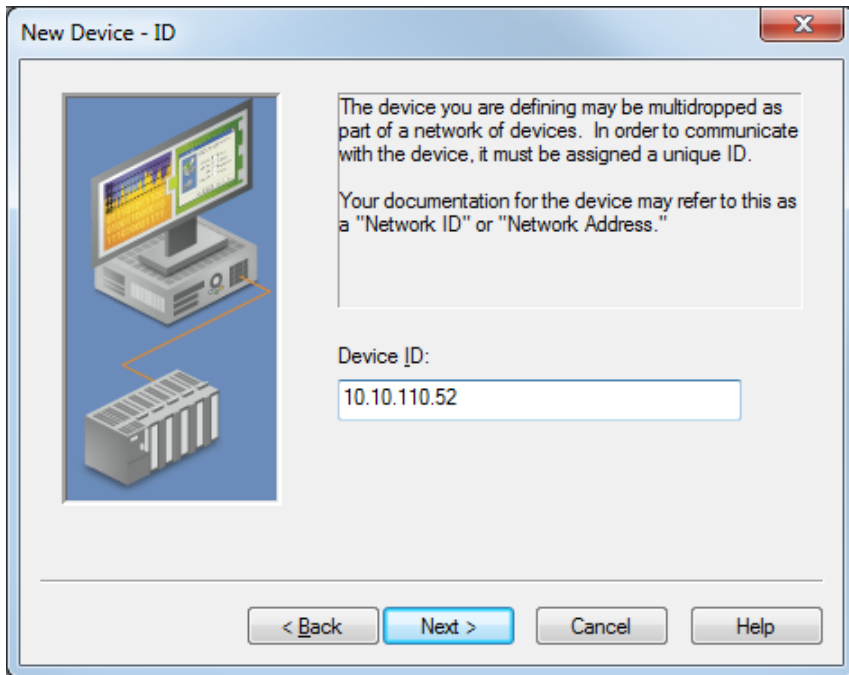
### 3.2 Adding a New Device

1. In the Configuration Utility, under “Channel1,” select **Click to add a device**.



2. In **Name**, either rename the new device or leave it at “Device1” and then click **Next**.
3. In **Model**, select **Modbus** from the drop-down list. Then, click **Next**.

4. In **Device ID**, set the device's IP address and then click **Next**. For example, "10.10.110.52". For a live device on the network, enter the IP address for that device.



**Note 1:** Using a loopback address (such as "127.0.0.1" or the IP address of the network adapter installed in the PC) tells the driver that the device acts as a Modbus slave. This functionality is not shown in this document.

**Note 2:** The image below displays information on configuring the Device ID (PLC network address). For more information, refer to Kepware's [Modbus TCP/IP Ethernet product manual](#).

#### **Device ID (PLC Network Address)**

The Device ID is used to specify the device IP address along with a Modbus Bridge Index on the Ethernet network.

Device IDs are specified as <HOST>.XXX, where *HOST* is a standard UNC/DNS name or an IP address. The *XXX* designates the Modbus Bridge Index of the device and can be in the range of 0 to 255. If no bridge is used, the index should be set to 0. Depending on the model and Device ID, a device could be configured to act as an unsolicited or master device. For more information on unsolicited mode, refer to [Modbus Unsolicited](#).

#### **Examples**

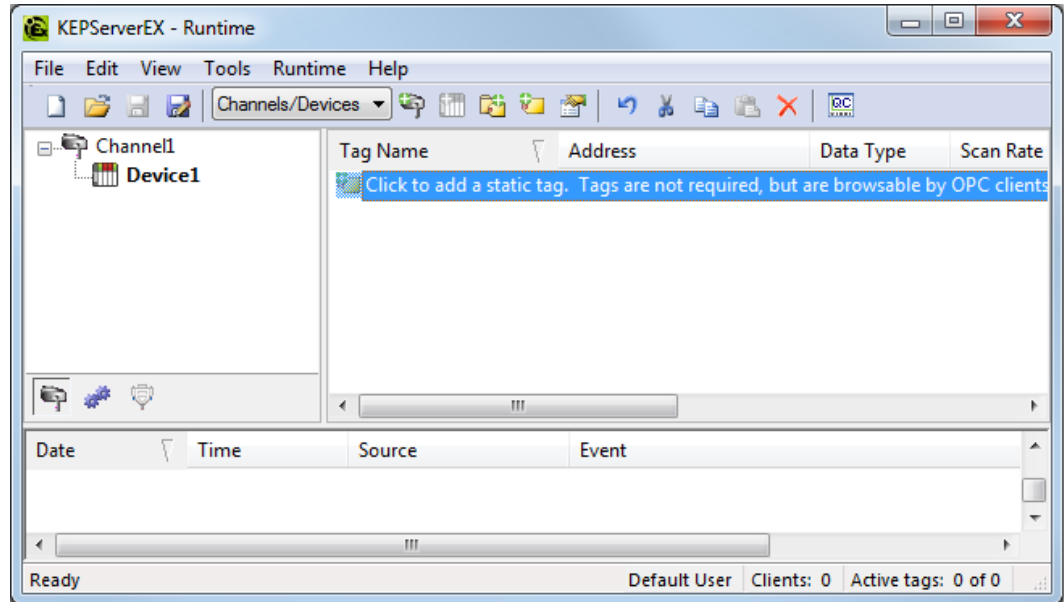
1. When requesting data from a Modicon TSX Quantum device with IP address 205.167.7.19, the Device ID should be entered as 205.167.7.19.0.
2. When requesting data from a Modbus Plus device connected to bridge index 5 of a Modbus TCP/IP Ethernet Bridge with an IP address of 205.167.7.50, the Device ID should be entered as 205.167.7.50.5.

- Continue through the New Device wizard, selecting the default setting in each of the remaining dialogs by clicking **Next**. In **Summary**, click **Finish**.

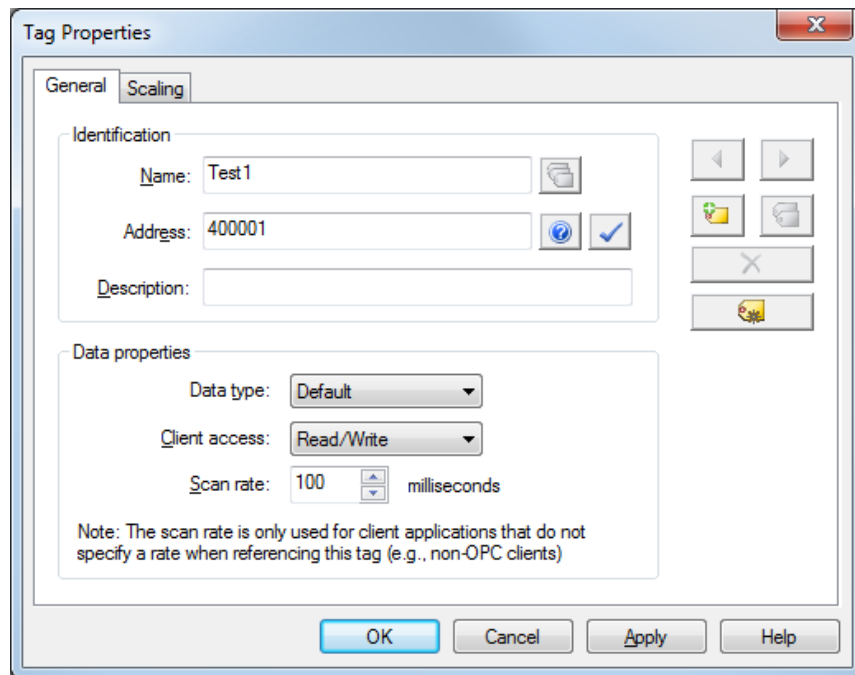
**Note:** At this point, the new device will be displayed in the new project.

### 3.3 Adding Tags

- In the Configuration Utility, click on “Device1” and then select **Click to add a static tag**.



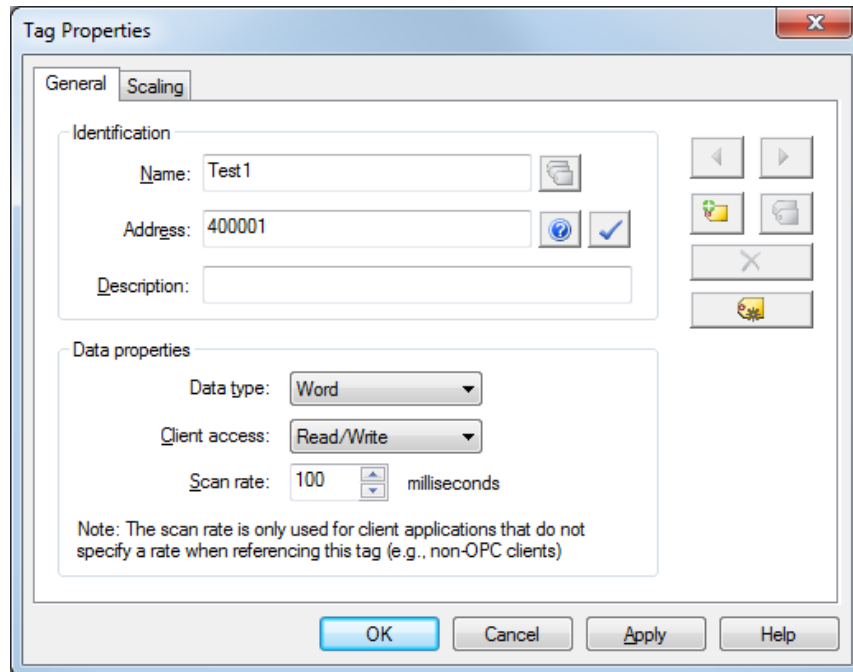
- In **Tag Properties**, enter “Test1” in **Name** and “400001” in **Address**. Then, click the checkmark button to validate the address syntax.





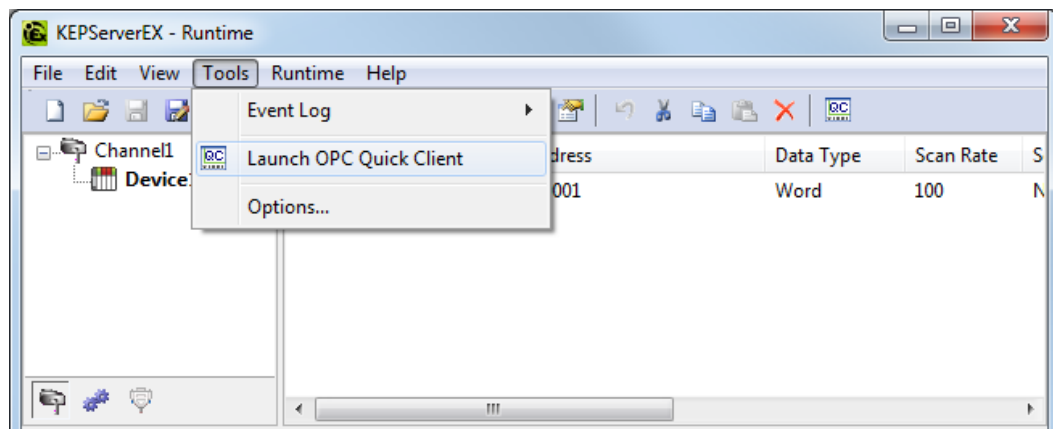
**Note:** Both five-digit addressing and six-digit addressing are supported. In Modbus addressing, the first digit of the address specifies the primary table. The remaining digits represent the device's data item. The maximum value is a two-byte unsigned integer (65,535). Six digits are required to represent the entire address table and item. As such, addresses that are specified in the device's manual as 0xxxx, 1xxxx, 3xxxx, or 4xxxx are "padded" with a pre-pended extra zero once applied.

3. Verify that the data type changes to the expected default setting for the address (Word). Then, leave the rest of the settings as they are and click **OK**.

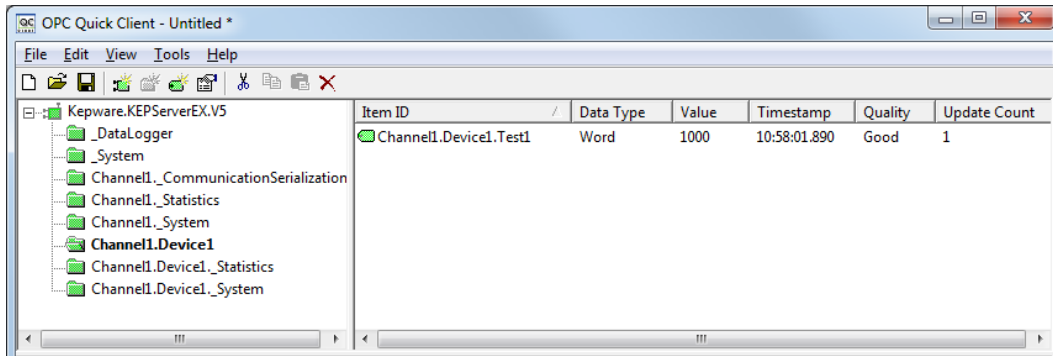


## 4. Verifying the Connection

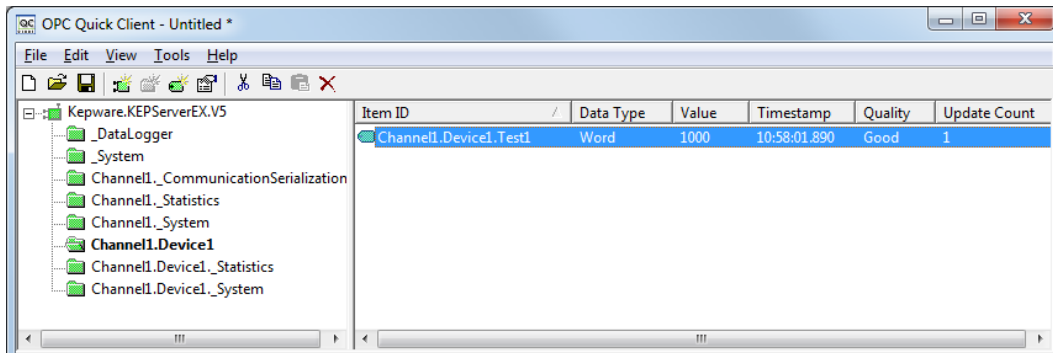
1. To verify that the tag's value can be read, launch the Quick Client by clicking **Tools | Launch OPC Quick Client**. Alternatively, select the **QC** icon in the toolbar.



2. In the left-hand pane, locate the group list and select "Channel1.Device1".



3. In the right-hand pane, verify that the Value, Quality, and Timestamp columns are populated for the "Channel1.Device1.Test1" tag.



**Note:** Having a value (which may be a zero) and "Good" in the Quality column confirms a successful connection to the device as well as the ability to read that tag from the designated memory register.

4. After confirming the values, close the Quick Client.

## 5. Summary

At this point, users should understand how to create a new project and connect to a Modbus Ethernet device.