Tech Note 912

Using Alternate TCP Port Numbers with Modbus Ethernet DAServer

Topic#: 002725
Created: January 2013

Introduction

This *Tech Note* outlines configuring the Wonderware Modbus Ethernet DAServer (DASMBTCP) to use TCP Ports other than the default port number **TCP 502**.

Application Version

- DASMBTCP 1.5 SP1 or greater

Configuring DASMBTCP

Overview

In order to demonstrate the capability of configuring alternate TCP ports in all of the possible configurations, we will create multiple device configurations within DASMBTCP via the Wonderware System Management Console (SMC).

The first configuration item within the DASMBTCP structure is the TCPIP_Port object. The editor interface will only allow you to have one TCPIP_Port object within the DASMBTCP configuration (Figure 1 below).

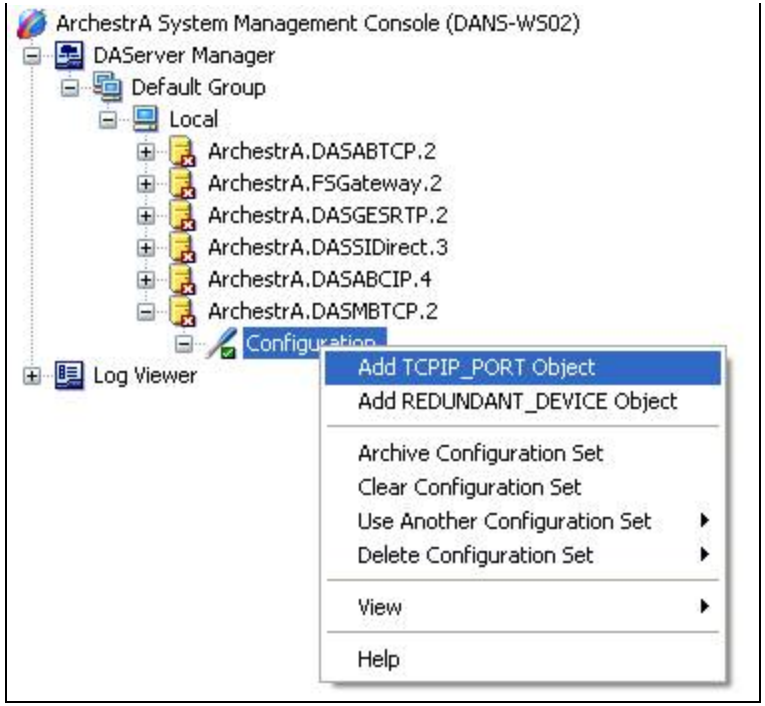


FIGURE 1: ADDING A TCPIP_PORT OBJECT

The TCPIP_Port object is not editable, and is set to TCP Port number 502. This is the default TCP Port for all devices, unless there is a device-specific TCP Port number defined. Even if you change this directly in the DASMBTCP XML configuration file, there will be no impact on any devices. You must set a device-specific TCP port if you want the device to use a TCP port other than 502 (Figure 2 below).

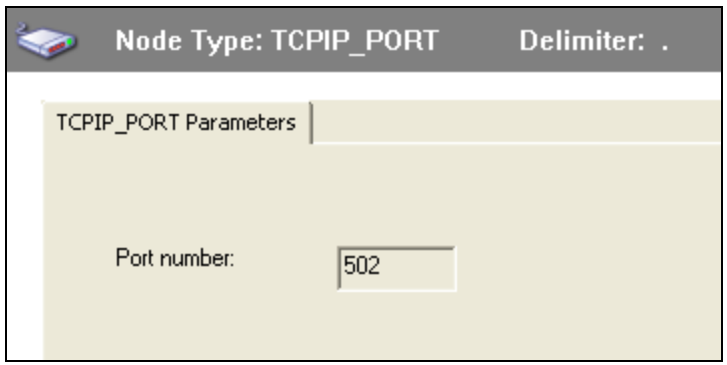


FIGURE 2: TCPIP_PORT OBJECT FACEPLATE

Configuring the Device

In this example we created a **TSXQuantum** object (Figure 3 below). This configuration also applies to the **TSXMomentum** and **TSXPremium** objects.

These devices do not have a UI configuration setting to allow for an override of the default TCP port number. You need to do this

manually in the **DASMBTCP** XML configuration file. A device Group called **Topic_100** is created for this device.

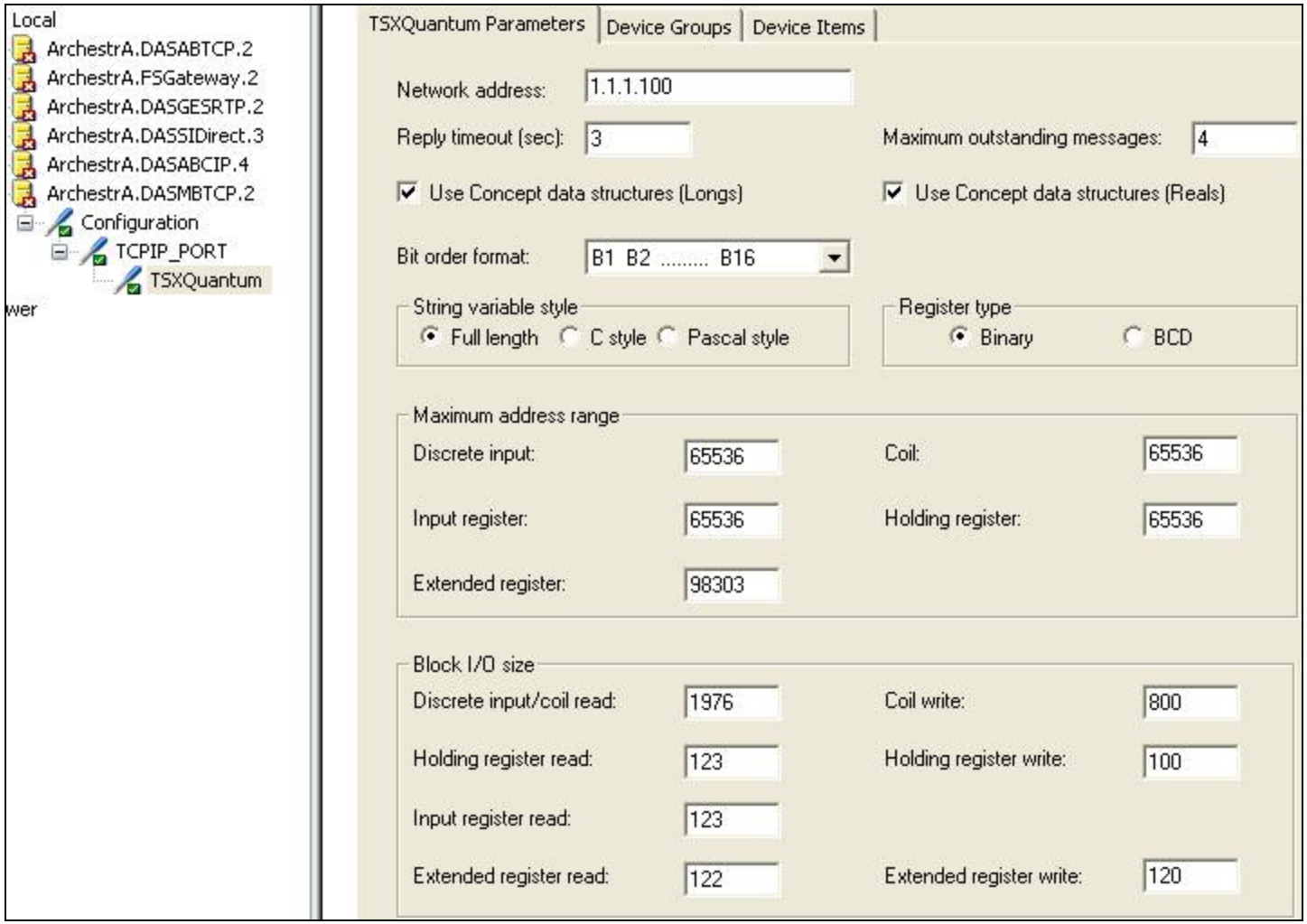


FIGURE 3: TSXQUANTUM OBJECT FACEPLATE

Next we create the **ModbusPLC** object (Figure 4 below). Note that the **ModbusPLC** object has a UI configuration setting to allow overriding the default TCP port number.

To set the TCP Port number for this device, you simply type the Port Number in the **Port number** field. It is not shown, but a device Group called **Topic_101** is created for this device.

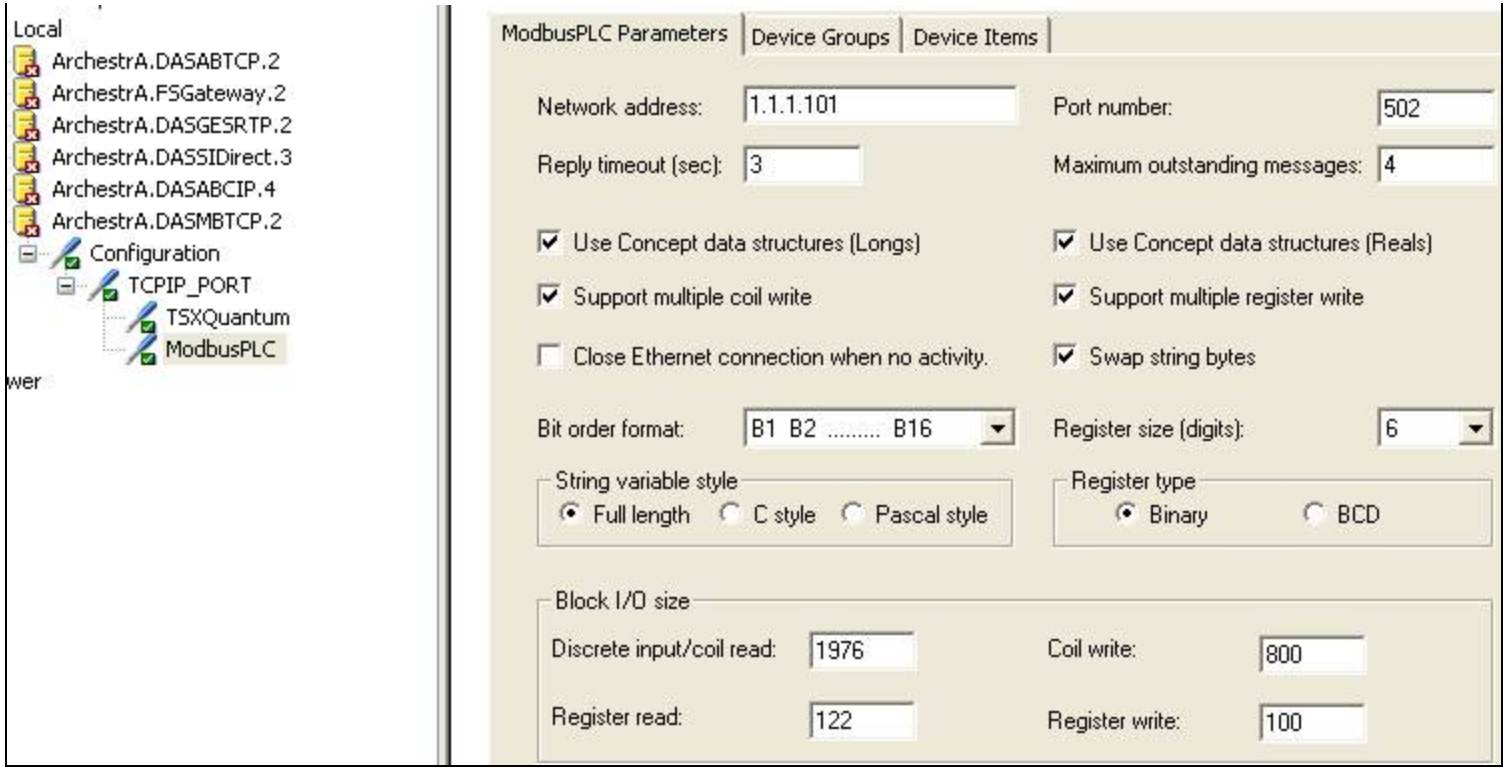


FIGURE 4: MODBUSPLC OBJECT FACEPLATE

Next we create the **ModbusBridge** object with **ModbusPLCRS** object (Figures 5 and 6 below).

Note that the ModbusBridge object does not have a UI configuration setting to allow us to override the default TCP port number. You need to do this manually in the **DASMBTCP** XML configuration file. It is not shown, but a device Group called **Topic_102** is created for this device.

Since the TCP Port setting applies to the ModbusBridge object that contains the IP address, this example configuration also applies when using the **Compact984**, **ModiconMicro**, and **TSXMomentumRS** sub-objects under the ModbusBridge. This also means that each bridge can have a different TCP port configured.

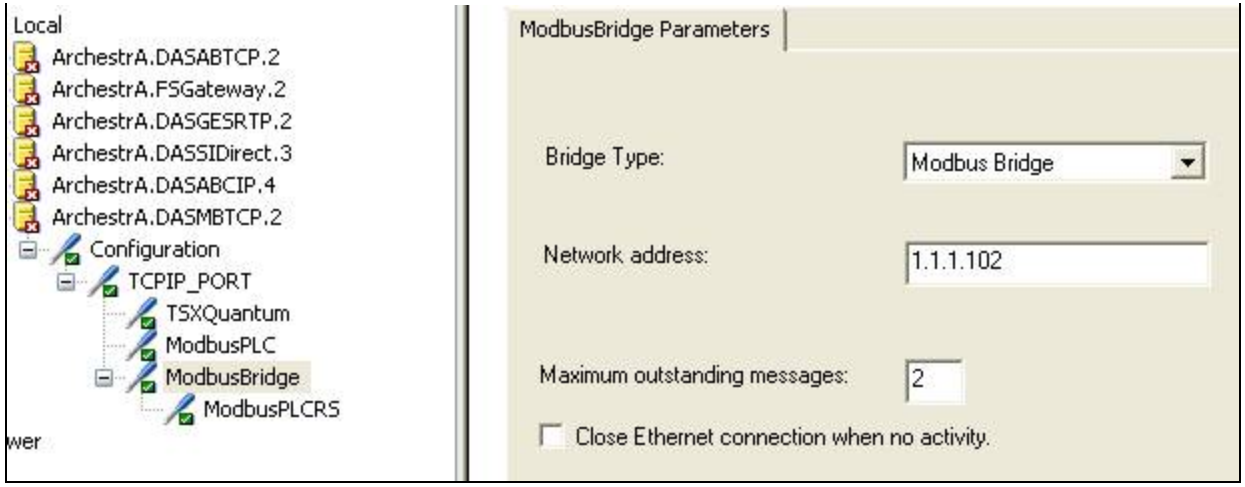


FIGURE 5: MODBUSBRIDGE OBJECT FACEPLATE

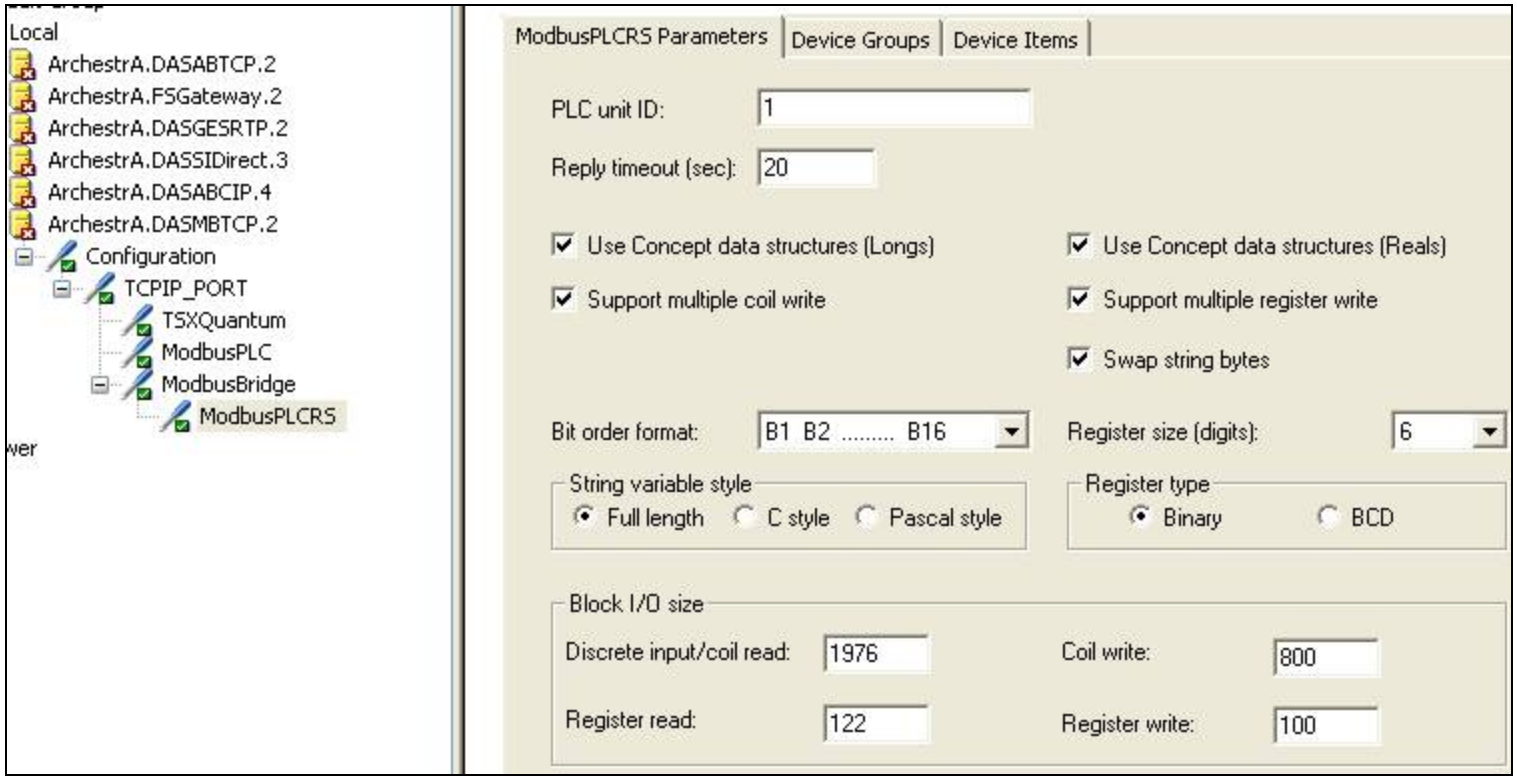


FIGURE 6: MODBUSPLCRS OBJECT FACEPLATE

Now that we have a few devices configured, we can activate DASMBTCP and use WWClient to attempt to read from the devices (Figure 7 below).

Figure 7: Reading From Each Topic

If we run NETSTAT from a Command Prompt, we can see the three connections being attempted, all using TCP port **502** (Figure 8 below). Note that we did not have actual devices to connect to with these IP addresses, so the connection state does not show as Established in the screen capture.

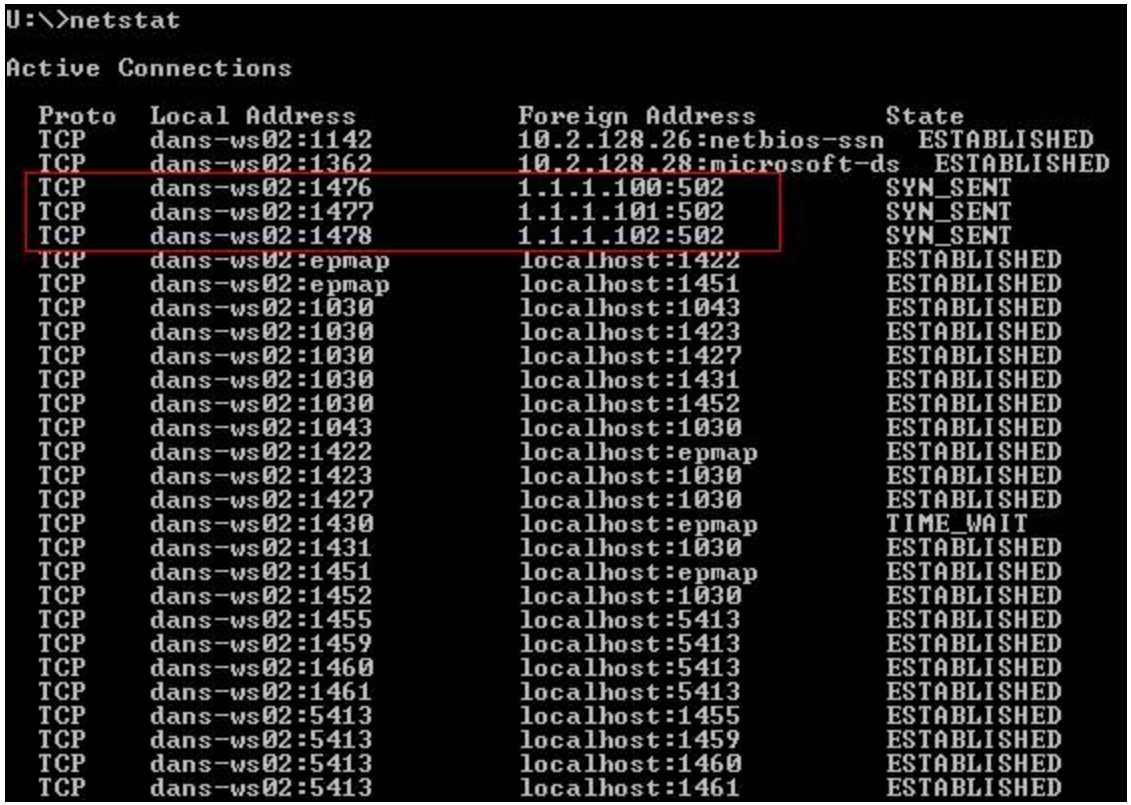


Figure 8: NETSTAT Results Using default TCP Ports

Modifying TCP Port Settings

Modifying the TCP Port settings requires completing the following tasks.

Configuration Information and Tools

The DASMBTCP configuration file is in XML format and is stored in two possible locations (v2.0 and later). These may be hidden folders on your system, so you will first need to enable the option to show hidden file and folders.

Configuration file locations

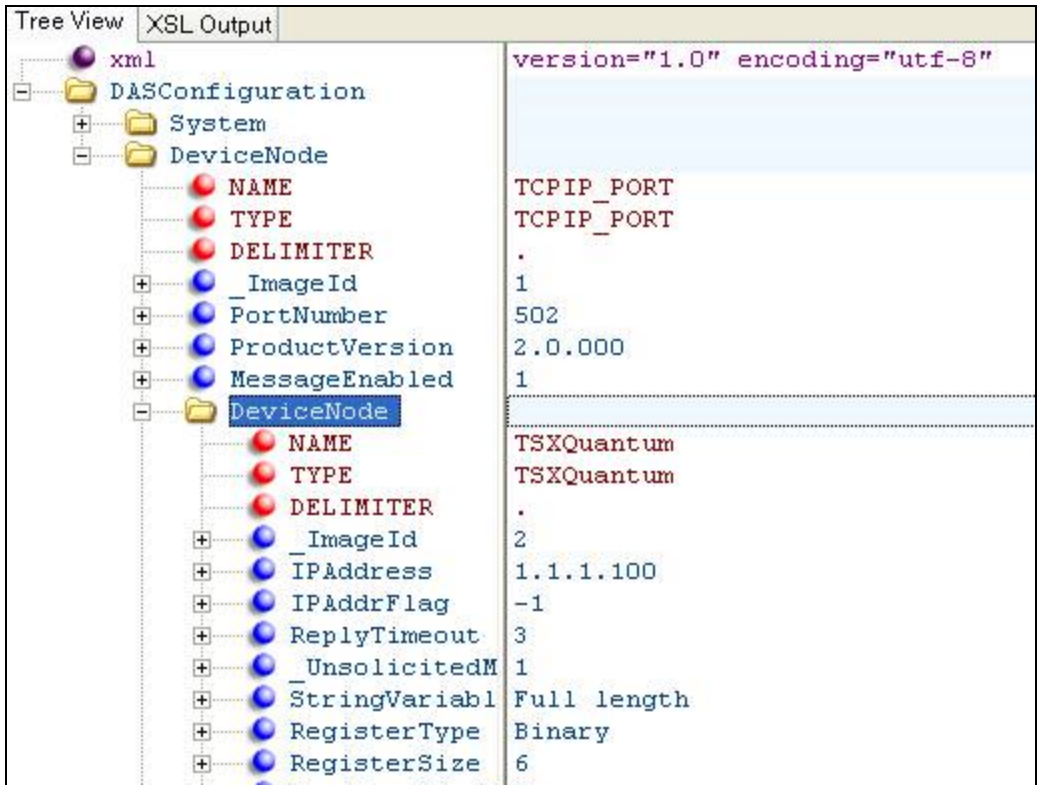
- Server 2003 and Windows XP: **C:\Documents and Settings\All Users\Application Data\Wonderware\DAServer\DASMBTCP\DASMBTCP.aaCFG**
- Server 2008, Windows 7, Windows Vista and newer: **C:\Program Data\Wonderware\DAServer\DASMBTCP\DASMBTCP.aaCFG**

The easiest and safest way to work directly with the configuration file is to use an XML Editor like Microsoft XML Notepad 2007.

Be sure that DASMBTCP is deactivated and the SMC is closed while you are modifying the configuration file.

Override Device TCP Port Configuration

1. Open the configuration file with XML Notepad and navigate to the device object you want to modify. In this step, we will modify the **TSXQuantum** object (under the **DeviceNode** folder), but the steps are the same for all devices where the Port Number is not available with the SMC user interface (Figure 9 below).



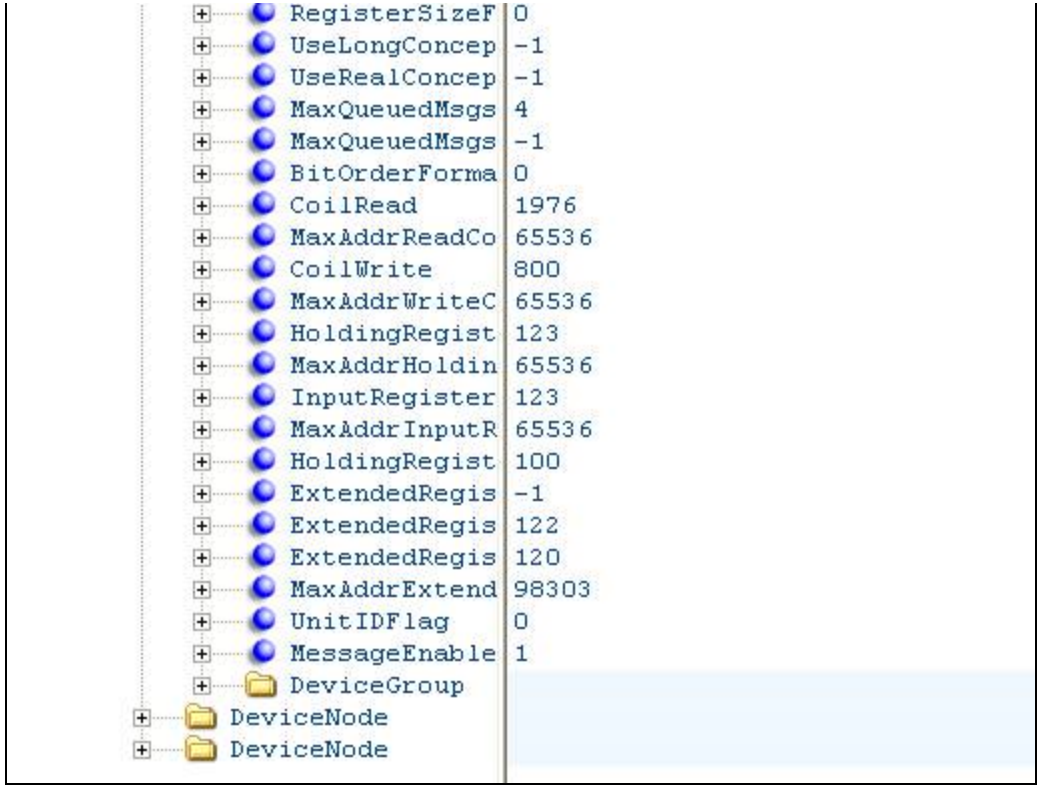


FIGURE 9: UNMODIFIED TSXQUANTUM CONFIGURATION VIEWED IN XML NOTEPAD

2. Right-click on the **IP Address** item and click **Insert** (Figure 10 below).

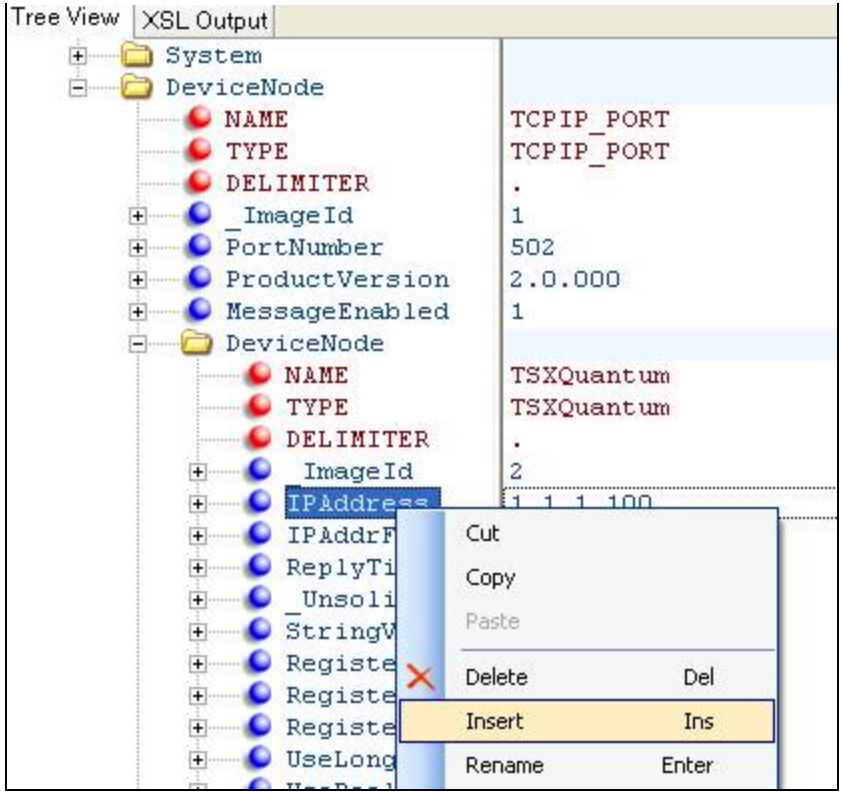


FIGURE 10: INSERTING A NEW XML ELEMENT

1. Name the new element **PortNumber** and type the value to the desired TCP Port number. In this case, we set it to **505** (Figure 11 below).

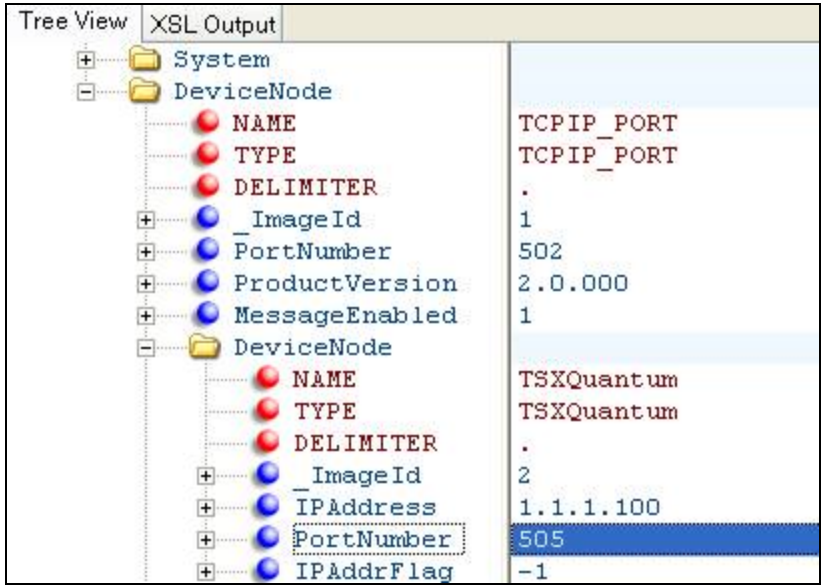


FIGURE 11: SETTING TSXQUANTUM OBJECT'S TCP PORT TO 505

I also set the **ModbusBridge** object to TCP Port 506 using these same steps. Setting the port Number is done within the **DeviceNode** section of the configuration file that correlates to the ModbusBridge object's configuration.

3. Close XML Notepad and open the SMC.
4. Change the ModbusPLC object's TCP **Port number** to **510** using the User Interface and save the changes (Figure 12 below).

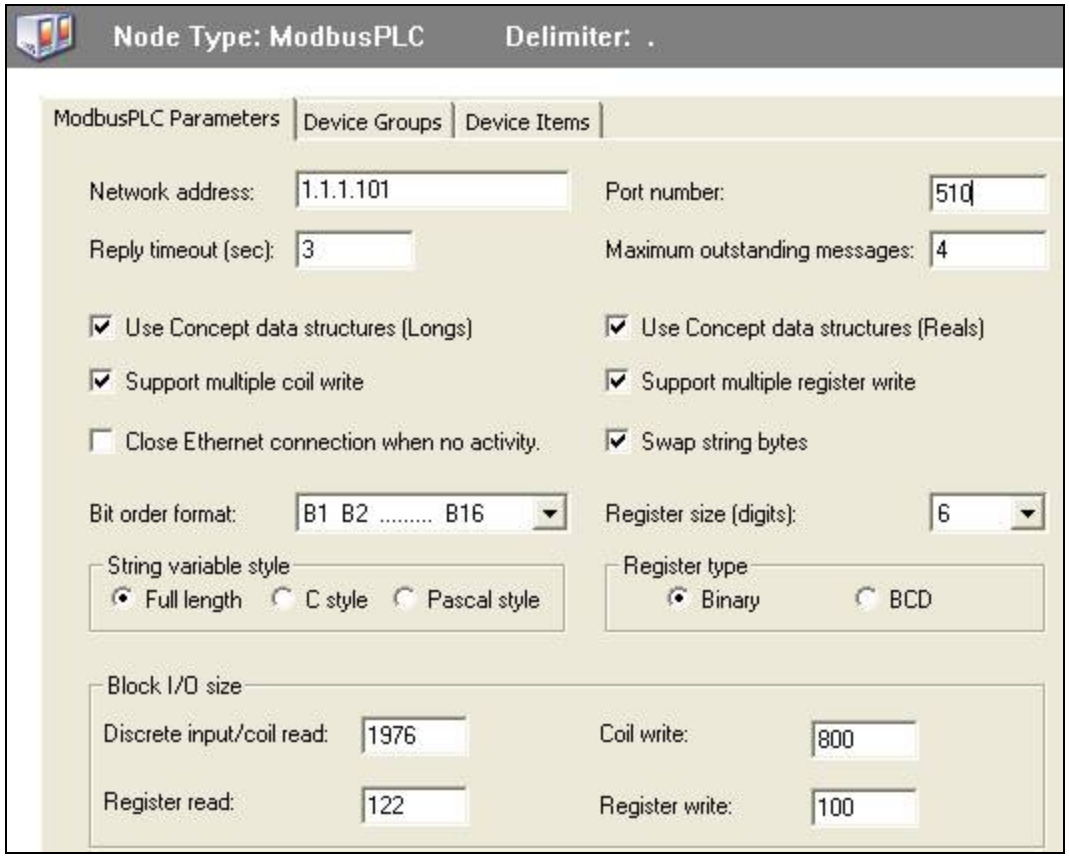
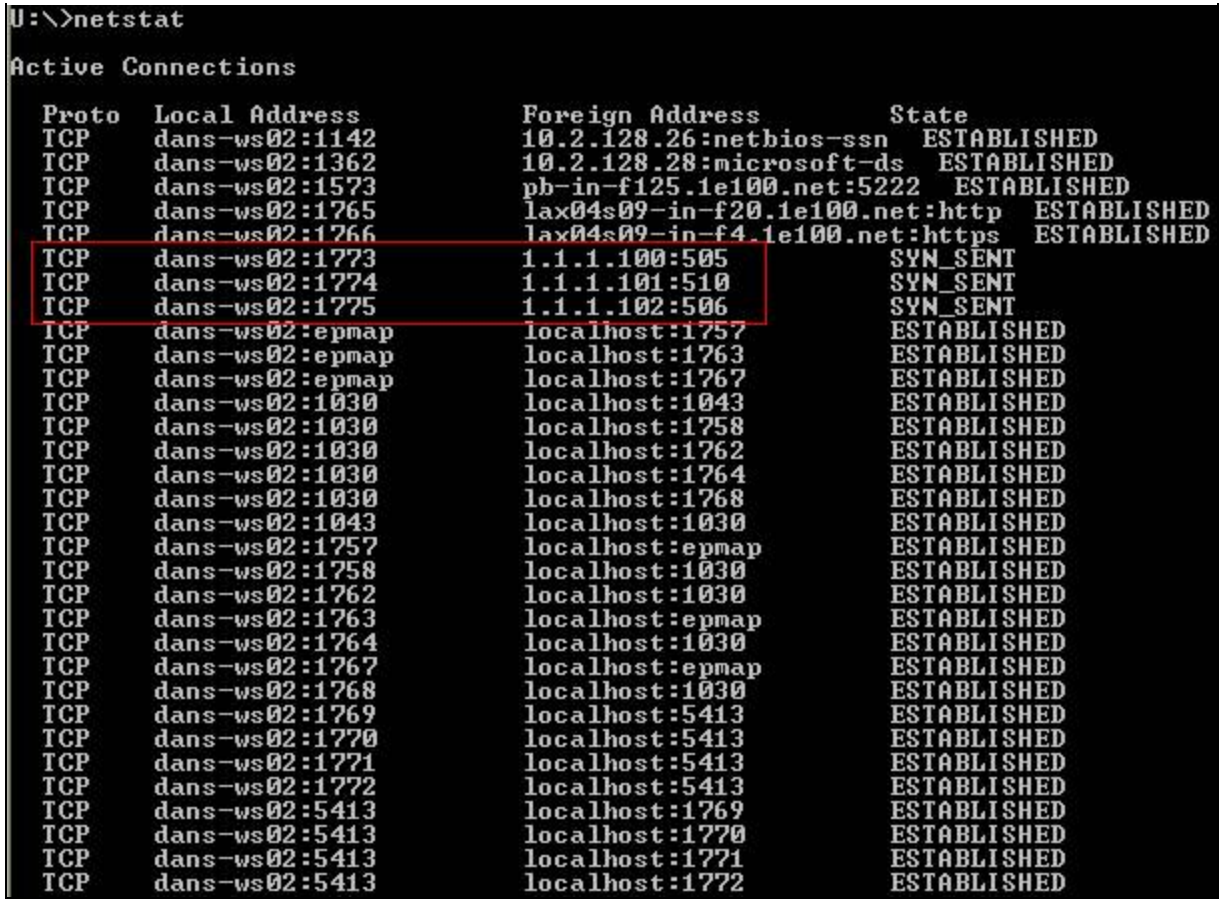


FIGURE 12: SETTING MODBUSPLC OBJECT'S TCP PORT TO 510

5. Activate DASMBTCP, and attempt to read from the devices again using WWClient. Then run NETSTAT from a command prompt. You can now see that each device is using the ports that we specified (Figure 13 below).



```
U:\>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    dans-ws02:1142         10.2.128.26:netbios-ssn  ESTABLISHED
  TCP    dans-ws02:1362         10.2.128.28:microsoft-ds  ESTABLISHED
  TCP    dans-ws02:1573         pb-in-f125.1e100.net:5222  ESTABLISHED
  TCP    dans-ws02:1765         lax04s09-in-f20.1e100.net:http  ESTABLISHED
  TCP    dans-ws02:1766         lax04s09-in-f4.1e100.net:https  ESTABLISHED
  TCP    dans-ws02:1773         1.1.1.100:505          SYN_SENT
  TCP    dans-ws02:1774         1.1.1.101:510          SYN_SENT
  TCP    dans-ws02:1775         1.1.1.102:506          SYN_SENT
  TCP    dans-ws02:epmap        localhost:1757         ESTABLISHED
  TCP    dans-ws02:epmap        localhost:1763         ESTABLISHED
  TCP    dans-ws02:epmap        localhost:1767         ESTABLISHED
  TCP    dans-ws02:1030         localhost:1043         ESTABLISHED
  TCP    dans-ws02:1030         localhost:1758         ESTABLISHED
  TCP    dans-ws02:1030         localhost:1762         ESTABLISHED
  TCP    dans-ws02:1030         localhost:1764         ESTABLISHED
  TCP    dans-ws02:1030         localhost:1768         ESTABLISHED
  TCP    dans-ws02:1043         localhost:1030         ESTABLISHED
  TCP    dans-ws02:1757         localhost:epmap        ESTABLISHED
  TCP    dans-ws02:1758         localhost:1030         ESTABLISHED
  TCP    dans-ws02:1762         localhost:1030         ESTABLISHED
  TCP    dans-ws02:1763         localhost:epmap        ESTABLISHED
  TCP    dans-ws02:1764         localhost:1030         ESTABLISHED
  TCP    dans-ws02:1767         localhost:epmap        ESTABLISHED
  TCP    dans-ws02:1768         localhost:1030         ESTABLISHED
  TCP    dans-ws02:1769         localhost:5413         ESTABLISHED
  TCP    dans-ws02:1770         localhost:5413         ESTABLISHED
  TCP    dans-ws02:1771         localhost:5413         ESTABLISHED
  TCP    dans-ws02:1772         localhost:5413         ESTABLISHED
  TCP    dans-ws02:5413         localhost:1769         ESTABLISHED
  TCP    dans-ws02:5413         localhost:1770         ESTABLISHED
  TCP    dans-ws02:5413         localhost:1771         ESTABLISHED
  TCP    dans-ws02:5413         localhost:1772         ESTABLISHED
```

FIGURE 13: NETSTAT RESULTS USING SPECIFIED TCP PORTS

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