

[Tech Note 912](#)

Using Alternate TCP Port Numbers with Modbus Ethernet DAServer

All Tech Notes, Tech Alerts and KBCD documents and software are provided "as is" without warranty of any kind. See the [Terms of Use](#) for more information.

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).

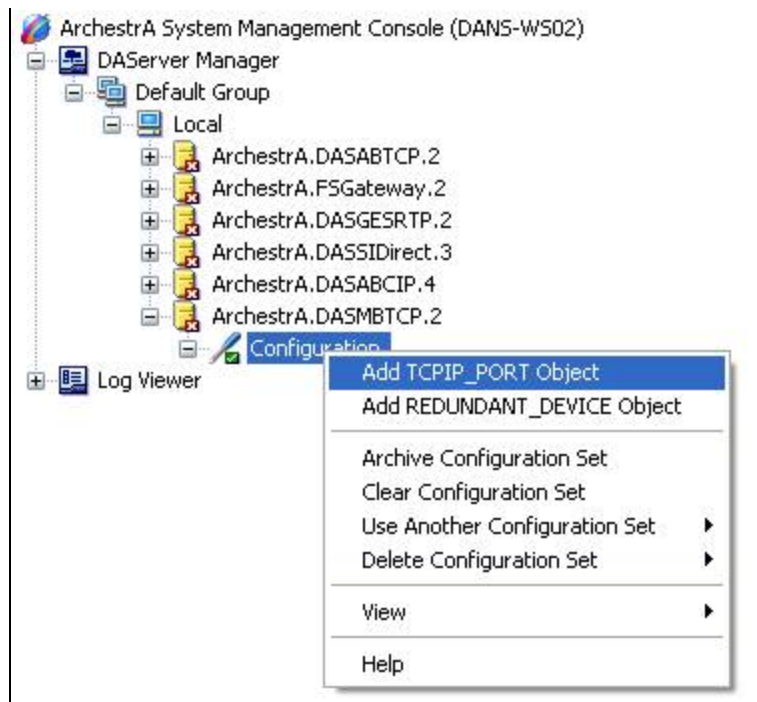


FIGURE 1: ADDING A TCPIP_PORT OBJECT

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).

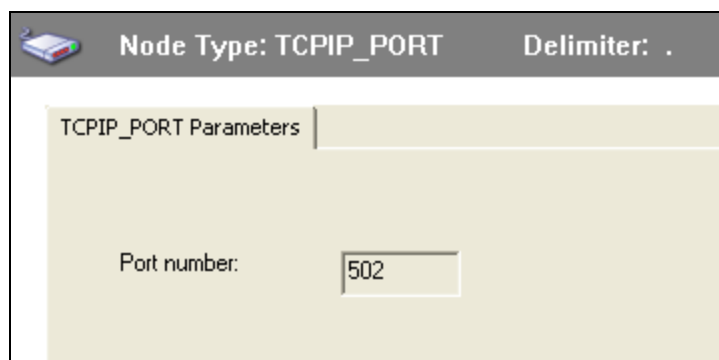


FIGURE 2: TCPIP_PORT OBJECT FACEPLATE

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.

The screenshot displays the configuration interface for a TSXQuantum device. The left-hand pane shows a tree view under 'Local' with several device objects, including 'ArchestrA.DASABTCP.2' through 'ArchestrA.DASMBTCP.2', and sub-items like 'Configuration', 'TCPIP_PORT', and 'TSXQuantum'. The right-hand pane is titled 'TSXQuantum Parameters' and contains the following settings:

- Network address: 1.1.1.100
- Reply timeout (sec): 3
- Maximum outstanding messages: 4
- Use Concept data structures (Longs)
- Use Concept data structures (Reals)
- Bit order format: B1 B2 B16
- String variable style: Full length, C style, Pascal style
- Register type: Binary, BCD
- Maximum address range:
 - Discrete input: 65536
 - Coil: 65536
 - Input register: 65536
 - Holding register: 65536
 - Extended register: 98303
- Block I/O size:
 - Discrete input/coil read: 1976
 - Coil write: 800
 - Holding register read: 123
 - Holding register write: 100
 - Input register read: 123
 - Extended register read: 122
 - Extended register write: 120

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.

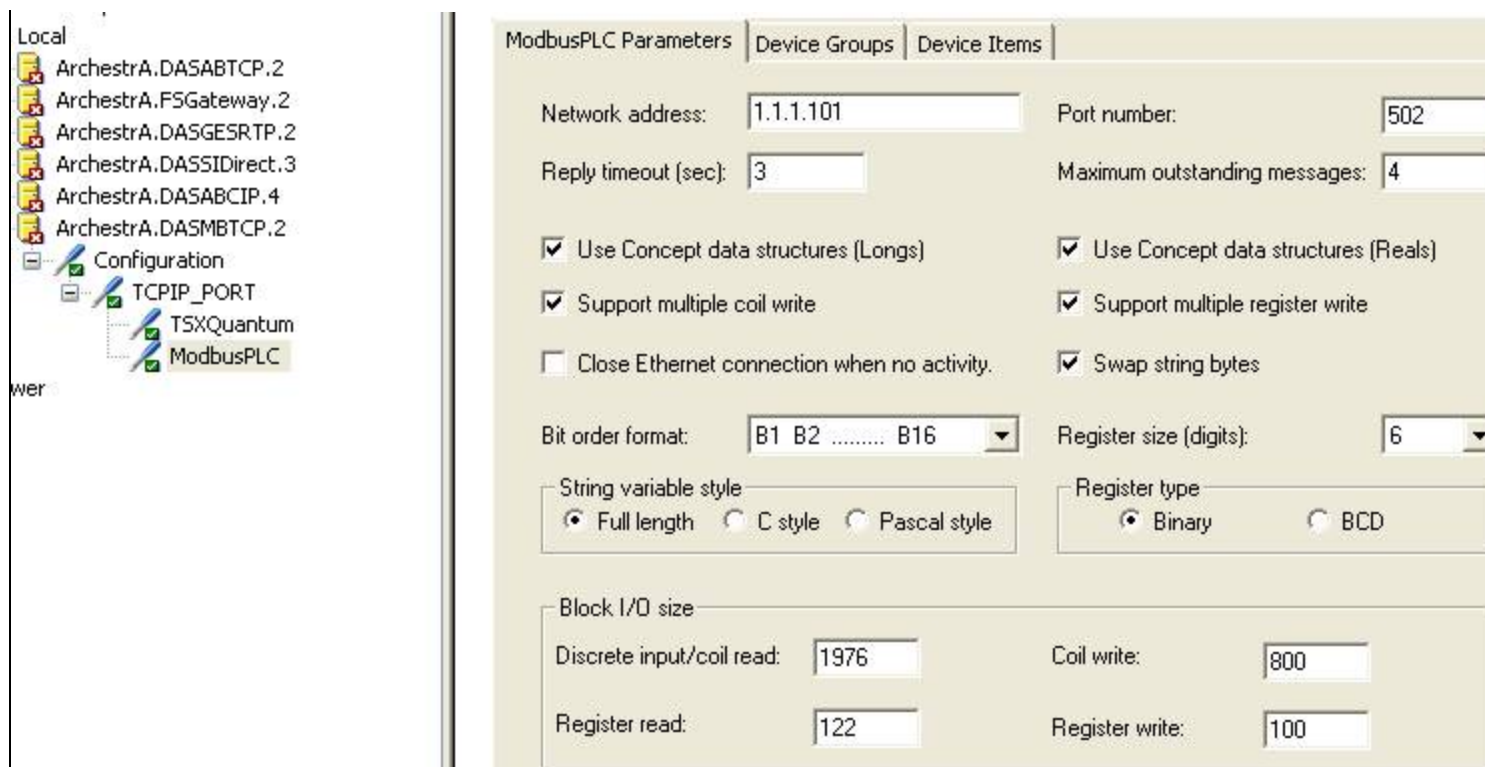


FIGURE 4: MODBUSPLC OBJECT FACEPLATE

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.

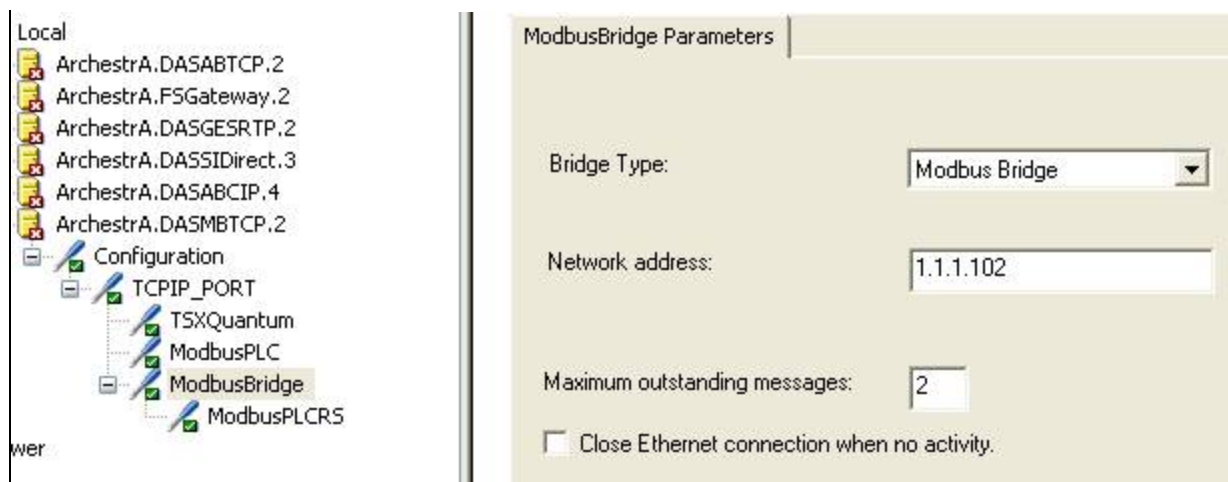


FIGURE 5: MODBUSBRIDGE OBJECT FACEPLATE

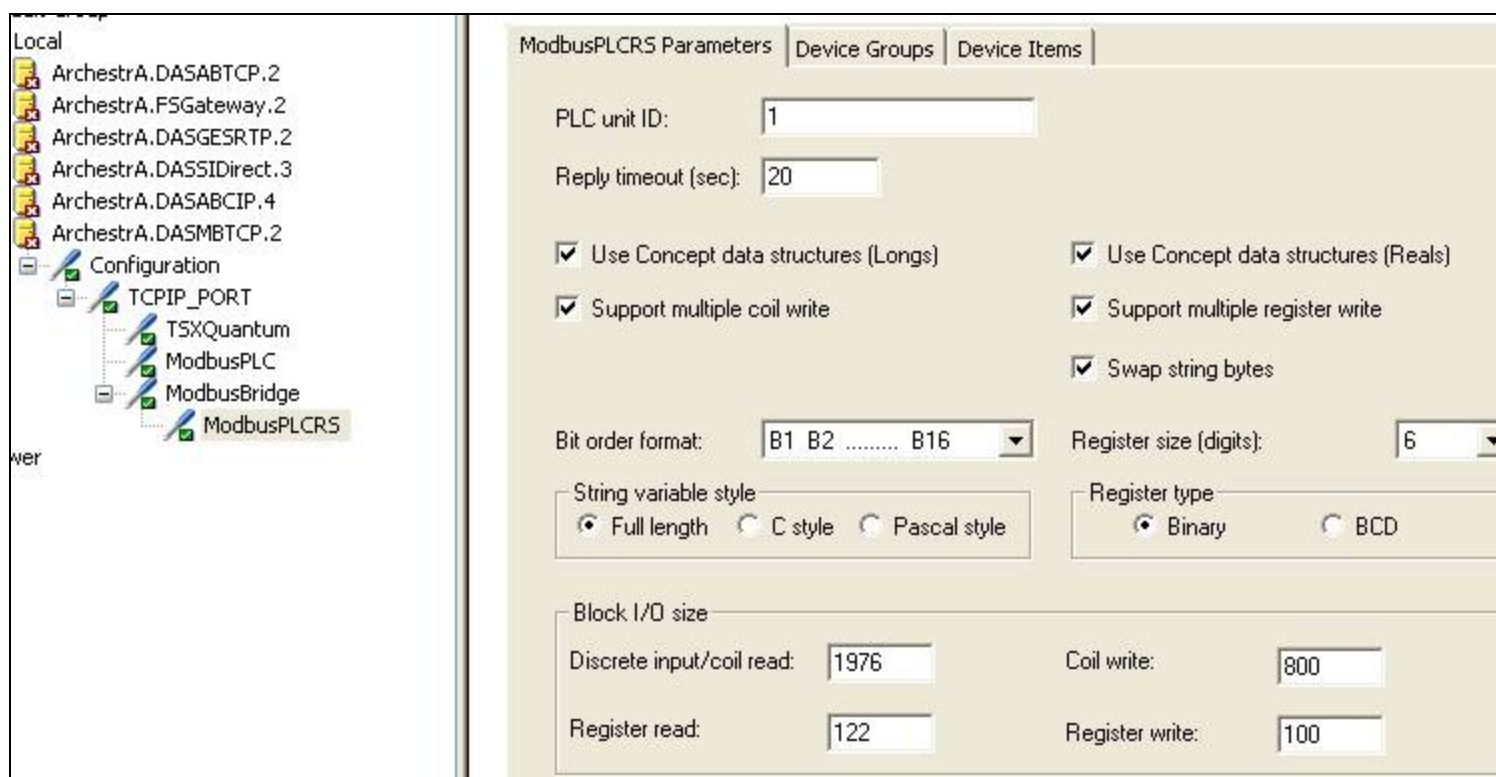


FIGURE 6: MODBUSPLCRS OBJECT FACEPLATE

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).

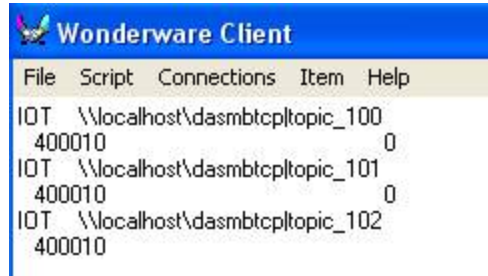


FIGURE 7: READING FROM EACH TOPIC

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.

```
U:\>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP   dans-ws02:1142         10.2.128.26:nethios-ssn ESTABLISHED
TCP   dans-ws02:1362         10.2.128.28:microsoft-ds ESTABLISHED
TCP   dans-ws02:1476         1.1.1.100:502           SYN_SENT
TCP   dans-ws02:1477         1.1.1.101:502           SYN_SENT
TCP   dans-ws02:1478         1.1.1.102:502           SYN_SENT
TCP   dans-ws02:epmap       localhost:1422          ESTABLISHED
TCP   dans-ws02:epmap       localhost:1451          ESTABLISHED
TCP   dans-ws02:1030        localhost:1043          ESTABLISHED
TCP   dans-ws02:1030        localhost:1423          ESTABLISHED
TCP   dans-ws02:1030        localhost:1427          ESTABLISHED
TCP   dans-ws02:1030        localhost:1431          ESTABLISHED
TCP   dans-ws02:1030        localhost:1452          ESTABLISHED
TCP   dans-ws02:1043        localhost:1030          ESTABLISHED
TCP   dans-ws02:1422        localhost:epmap         ESTABLISHED
TCP   dans-ws02:1423        localhost:1030          ESTABLISHED
TCP   dans-ws02:1427        localhost:1030          ESTABLISHED
TCP   dans-ws02:1430        localhost:epmap         TIME_WAIT
TCP   dans-ws02:1431        localhost:1030          ESTABLISHED
TCP   dans-ws02:1451        localhost:epmap         ESTABLISHED
TCP   dans-ws02:1452        localhost:1030          ESTABLISHED
TCP   dans-ws02:1455        localhost:5413          ESTABLISHED
TCP   dans-ws02:1459        localhost:5413          ESTABLISHED
TCP   dans-ws02:1460        localhost:5413          ESTABLISHED
TCP   dans-ws02:1461        localhost:5413          ESTABLISHED
TCP   dans-ws02:5413        localhost:1455          ESTABLISHED
TCP   dans-ws02:5413        localhost:1459          ESTABLISHED
TCP   dans-ws02:5413        localhost:1460          ESTABLISHED
TCP   dans-ws02:5413        localhost:1461          ESTABLISHED
```

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\DA Server\DASMBTCP\DASMBTCP.aacfg**
- Server 2008, Windows 7, Windows Vista and newer: **C:\Program Data\Wonderware\DA Server\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).

The screenshot displays the XML Notepad 2007 interface. The left pane shows a tree view of the configuration file structure:

- xml
 - DASConfiguration
 - System
 - DeviceNode
 - NAME
 - TYPE
 - DELIMITER
 - _ImageId
 - PortNumber
 - ProductVersion
 - MessageEnabled
 - DeviceNode
 - NAME
 - TYPE
 - DELIMITER
 - _ImageId
 - IPAddress
 - IPAddrFlag
 - ReplyTimeout
 - _UnsolicitedM
 - _StringVariabl
 - RegisterType
 - RegisterSize

The right pane shows the XML content for the selected **DeviceNode**:

```

version="1.0" encoding="utf-8"
TCPIP_PORT
TCPIP_PORT
.
1
502
2.0.000
1
-----
NAME
TYPE
DELIMITER
_ImageId
IPAddress
IPAddrFlag
ReplyTimeout
_UnsolicitedM
_StringVariabl
RegisterType
RegisterSize
  
```

+	+	RegisterSizeF	0
+	+	UseLongConcep	-1
+	+	UseRealConcep	-1
+	+	MaxQueuedMsgs	4
+	+	MaxQueuedMsgs	-1
+	+	BitOrderForma	0
+	+	CoilRead	1976
+	+	MaxAddrReadCo	65536
+	+	CoilWrite	800
+	+	MaxAddrWriteC	65536
+	+	HoldingRegist	123
+	+	MaxAddrHoldin	65536
+	+	InputRegister	123
+	+	MaxAddrInputR	65536
+	+	HoldingRegist	100
+	+	ExtendedRegis	-1
+	+	ExtendedRegis	122
+	+	ExtendedRegis	120
+	+	MaxAddrExtend	98303
+	+	UnitIDFlag	0
+	+	MessageEnable	1
+	+	DeviceGroup	
+	+	DeviceNode	
+	+	DeviceNode	

FIGURE 9: UNMODIFIED TSXQUANTUM CONFIGURATION VIEWED IN XML NOTEPAD

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

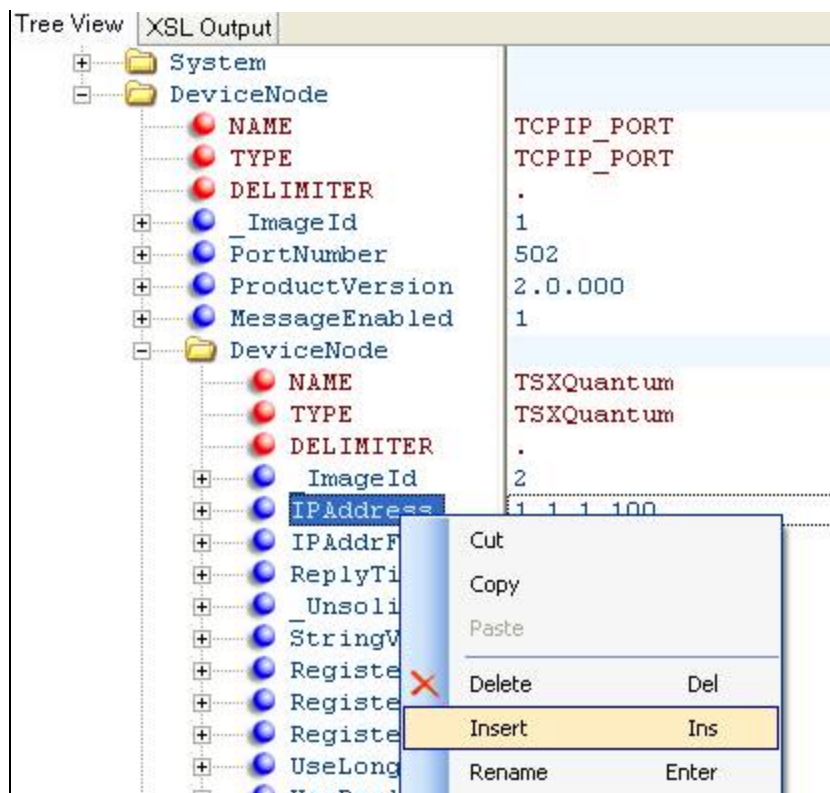


FIGURE 10: INSERTING A NEW XML ELEMENT

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).

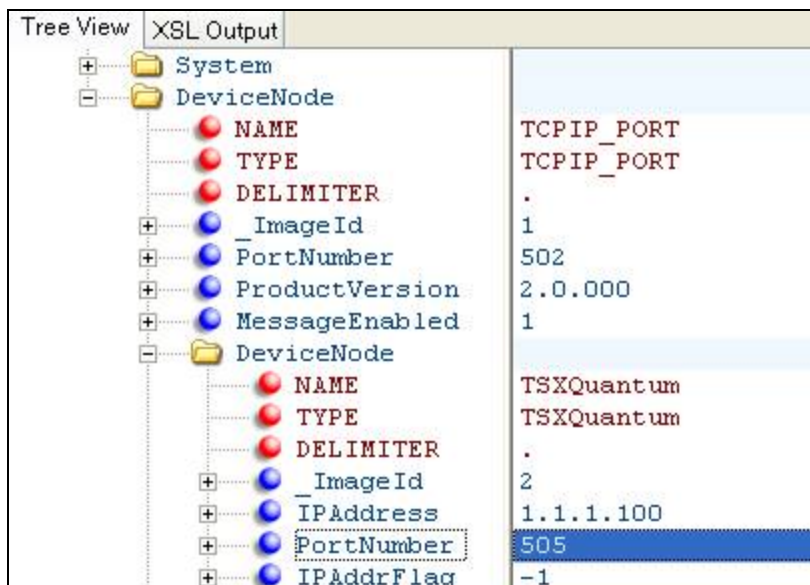
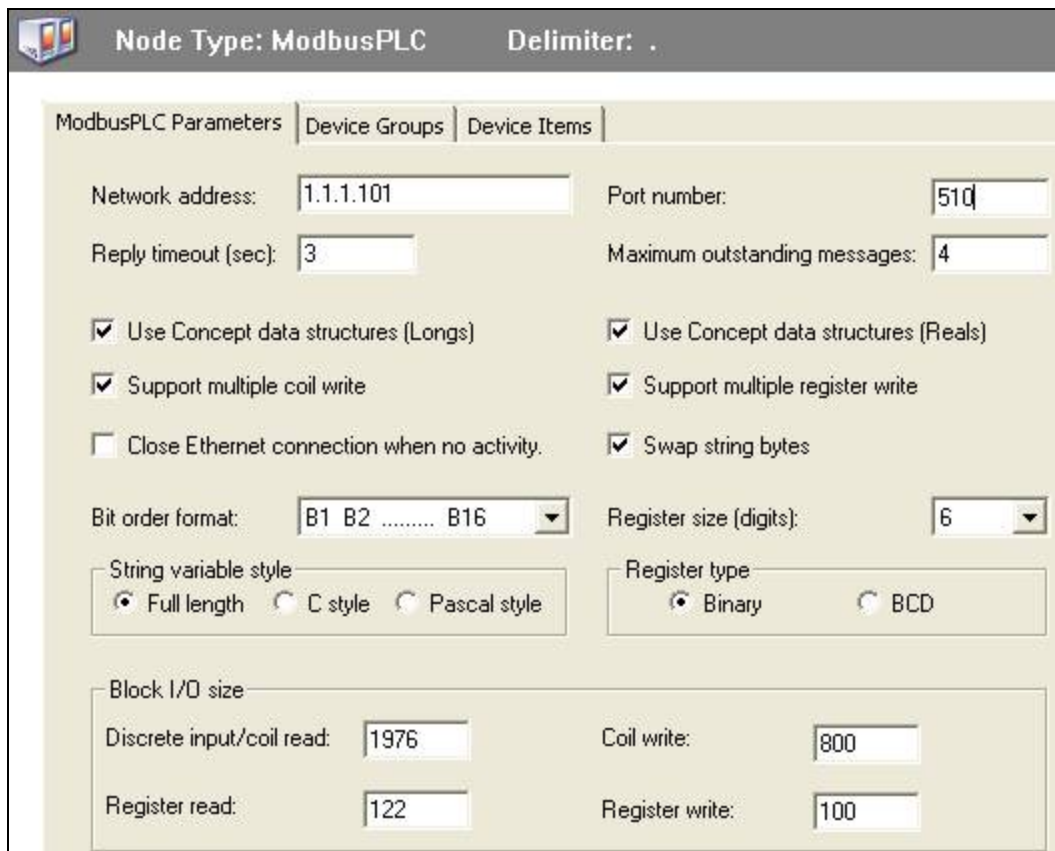


FIGURE 11: SETTING TSXQUANTUM OBJECT'S TCP PORT TO 505

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).



The screenshot shows the configuration window for a ModbusPLC object. The title bar indicates "Node Type: ModbusPLC" and "Delimiter: .". The window has three tabs: "ModbusPLC Parameters", "Device Groups", and "Device Items". The "ModbusPLC Parameters" tab is active. The "Port number" field is set to 510. Other fields include Network address (1.1.1.101), Reply timeout (3), Maximum outstanding messages (4), Bit order format (B1 B2 B16), Register size (6), String variable style (Full length), and Register type (Binary). The "Block I/O size" section includes Discrete input/coil read (1976), Coil write (800), Register read (122), and Register write (100).

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:nethbios-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

D. Scott

Tech Notes are published occasionally by Wonderware Technical Support. Publisher: Invensys Systems, Inc., 26561 Rancho Parkway South, Lake Forest, CA 92630. There is also technical information on our software products at [Wonderware Technical Support](#).

For technical support questions, send an e-mail to wwsupport@invensys.com.

 [Back to top](#)

©2013 Invensys Systems, Inc. All rights reserved. No part of the material protected by this copyright may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, broadcasting, or by any information storage and retrieval system, without permission in writing from Invensys Systems, Inc.

[Terms of Use](#).