Modbus Slave TCP Raw-Data Setup and Test

Materials required:
Modbus Slave from http://www.modbustools.com
DeviceMaster UP running Modbus/TCP version 4.09
DeviceMaster Loopback Plug
Comtrol Test Terminal (WCom2).
Please note: The Modbus Poll application is not freeware. You may use the application for 10 minutes from connection. After 10 minutes the connection is broken. Re-starting the Modbus Poll application will initiate another 10 minute demonstration period. After 30 days it will no longer operate without purchase.

This document will show step-by-step instructions of how to setup and configure the DeviceMaster UP in Modbus TCP Raw Data mode and use the Modbus Slave and HyperTerminal application's to test the configuration.

This manual contains no explanations for the procedures outlined here. For full information and details, please see the DeviceMaster UP Modbus user guide and the Modbus Slave and Modbus Poll user guides.

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Chapter 2: Modbus Slave Configuration Page 8
Chapter 3: Test Terminal (WCom2) Configuration Page 13
Chapter 4: Verification of Operation Page 14

DeviceMaster Configuration

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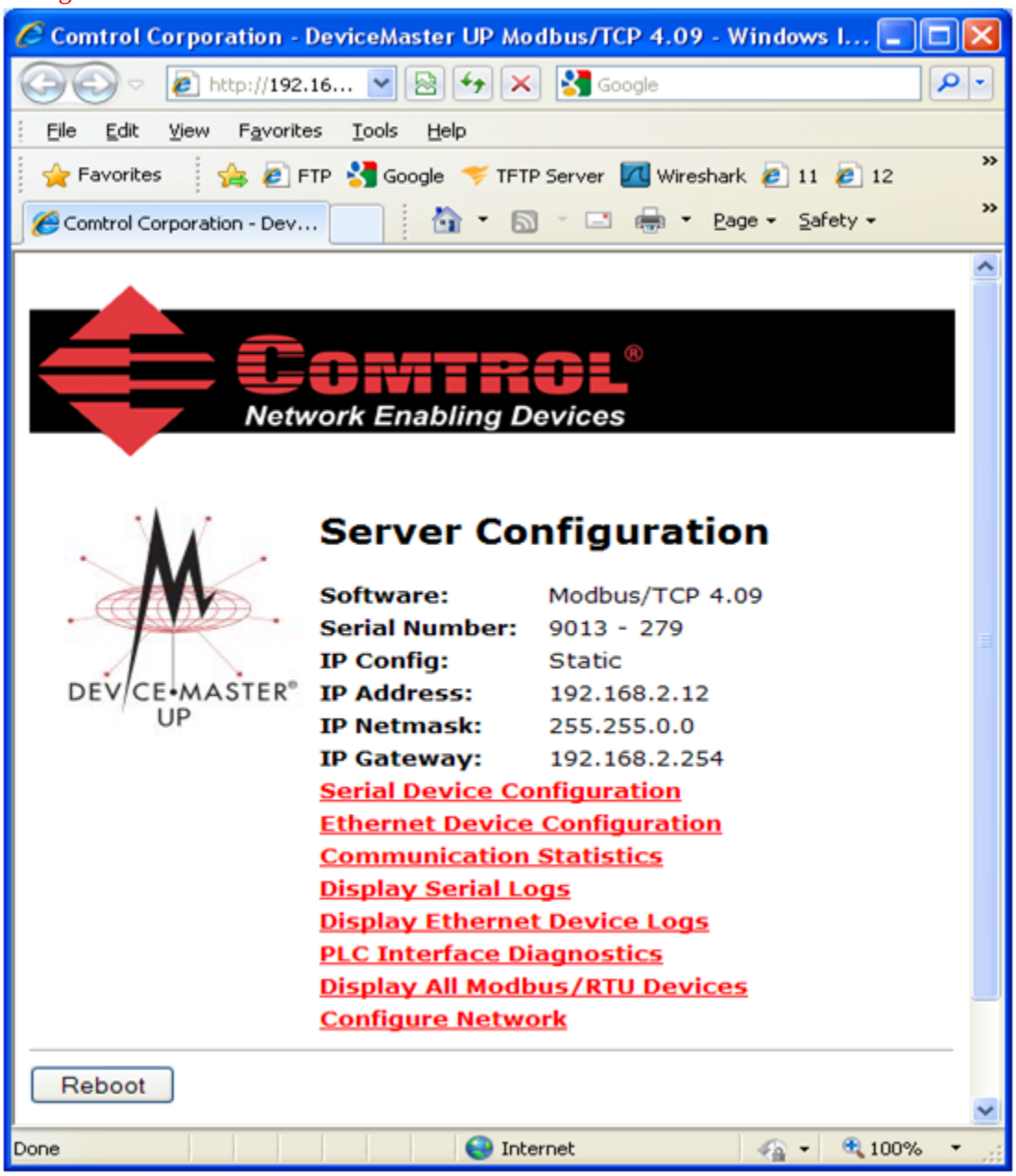
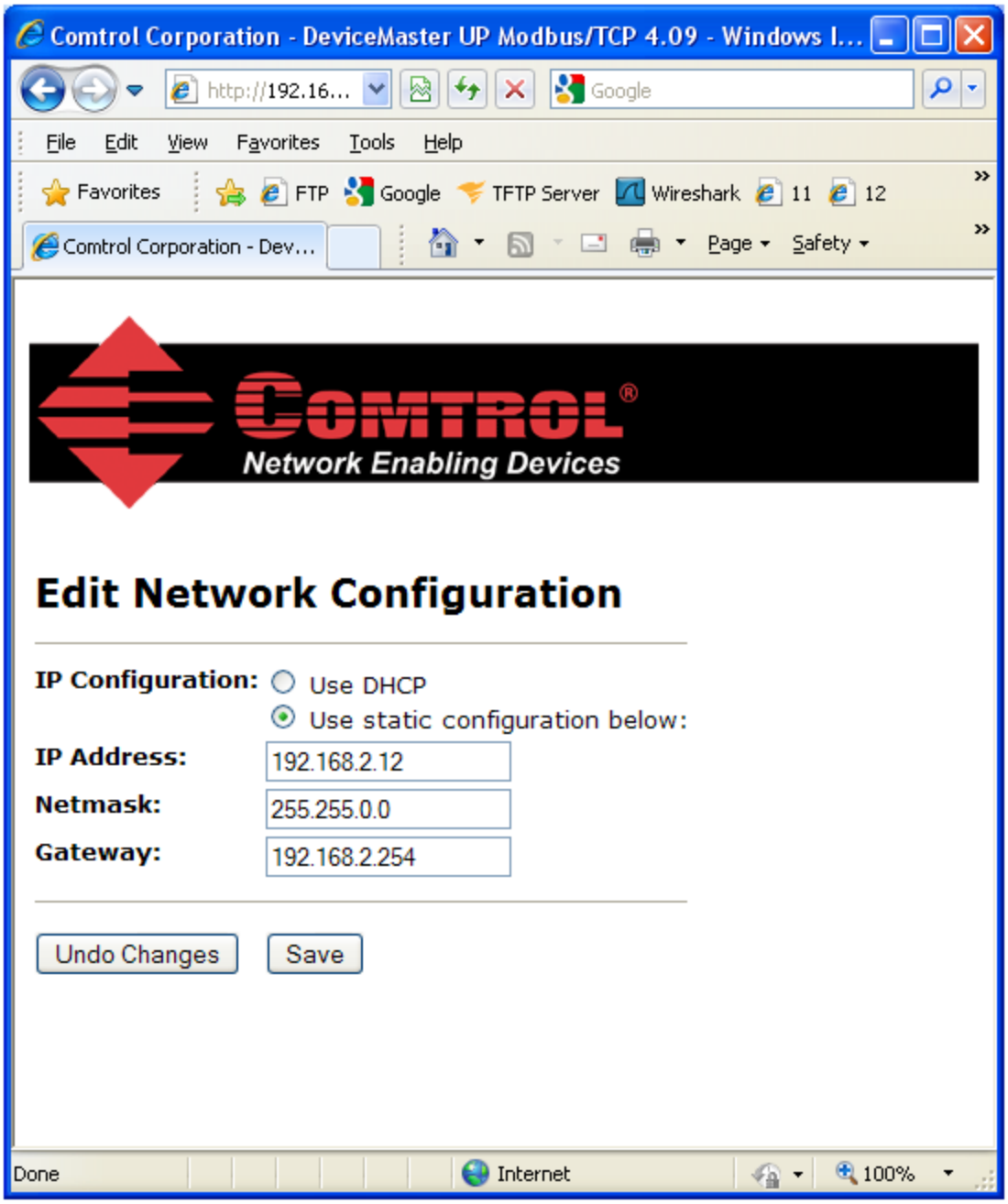
The web pages for this example are as follow. There are only two pages that will need to be configured:
Serial Device Configuration
and
Configure Network



Please note the version number. If necessary, begin by downloading the current firmware and use PortVision Plus to update the firmware in the DeviceMaster.
Here is a link to download the firmware:
ftp://ftp.comtrol.com/dev_mstr/up/software/modbus_tcp/firmware/modbus_tcp_4.09.msi

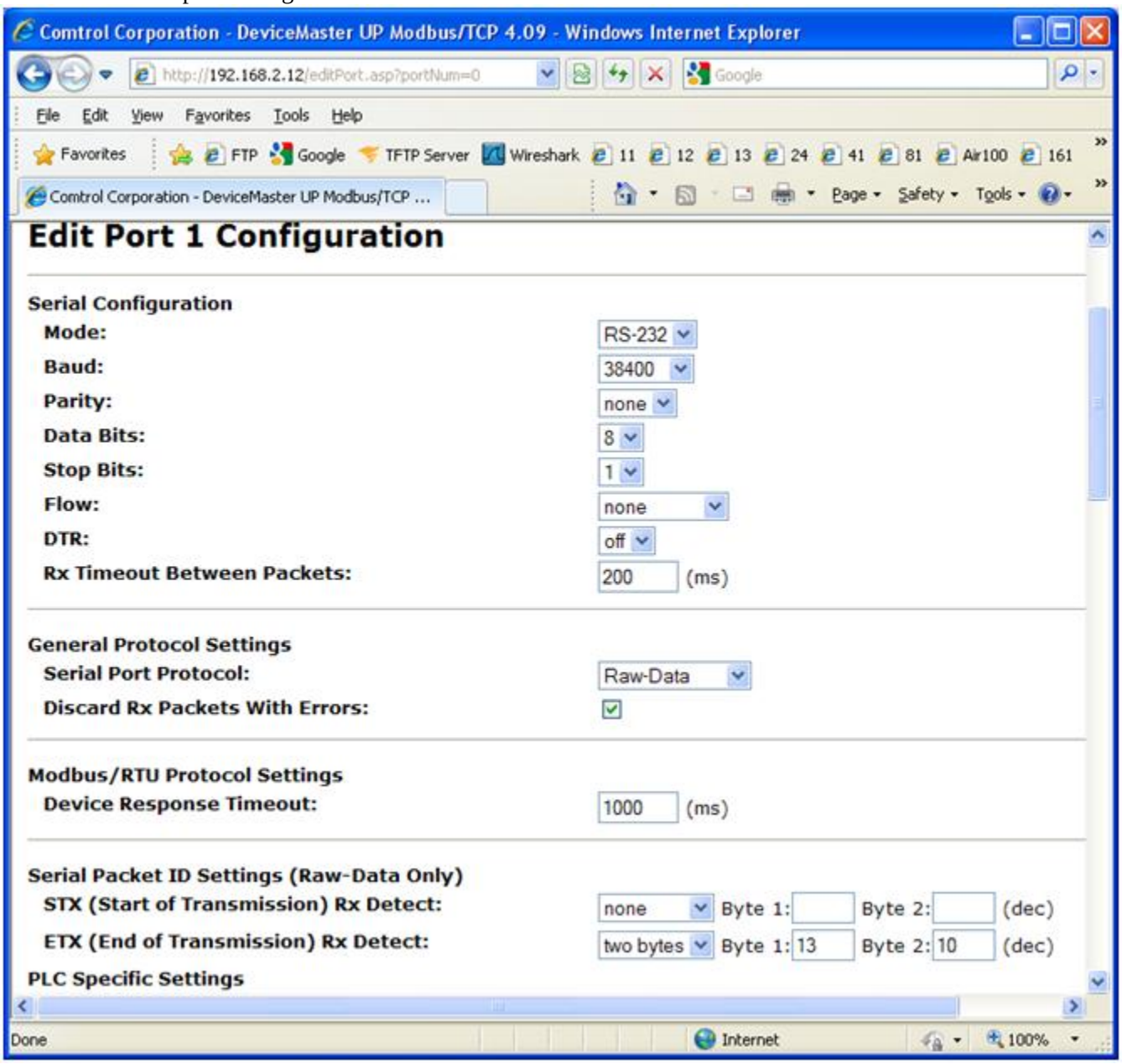
These are the network setting used in this example:

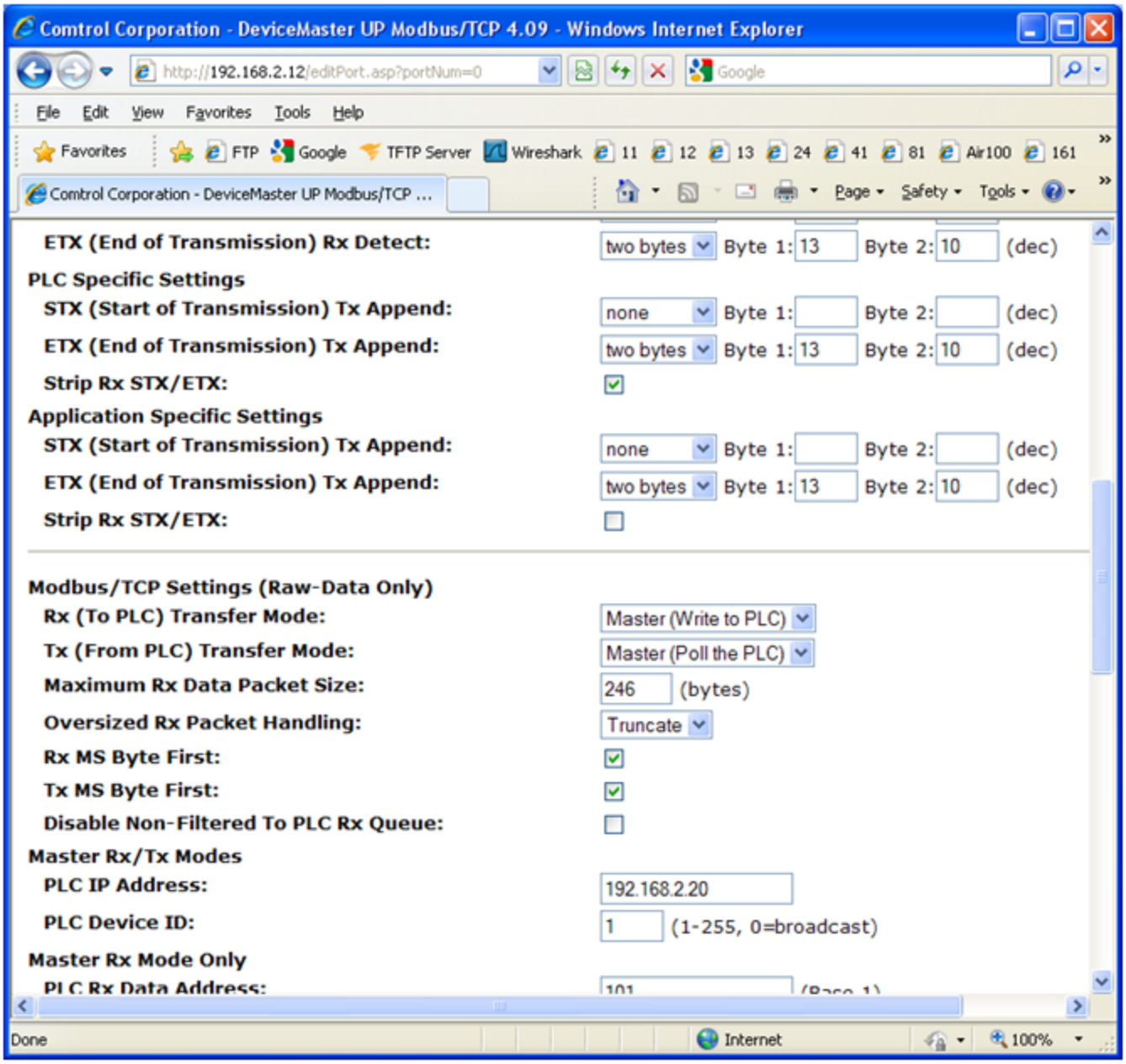


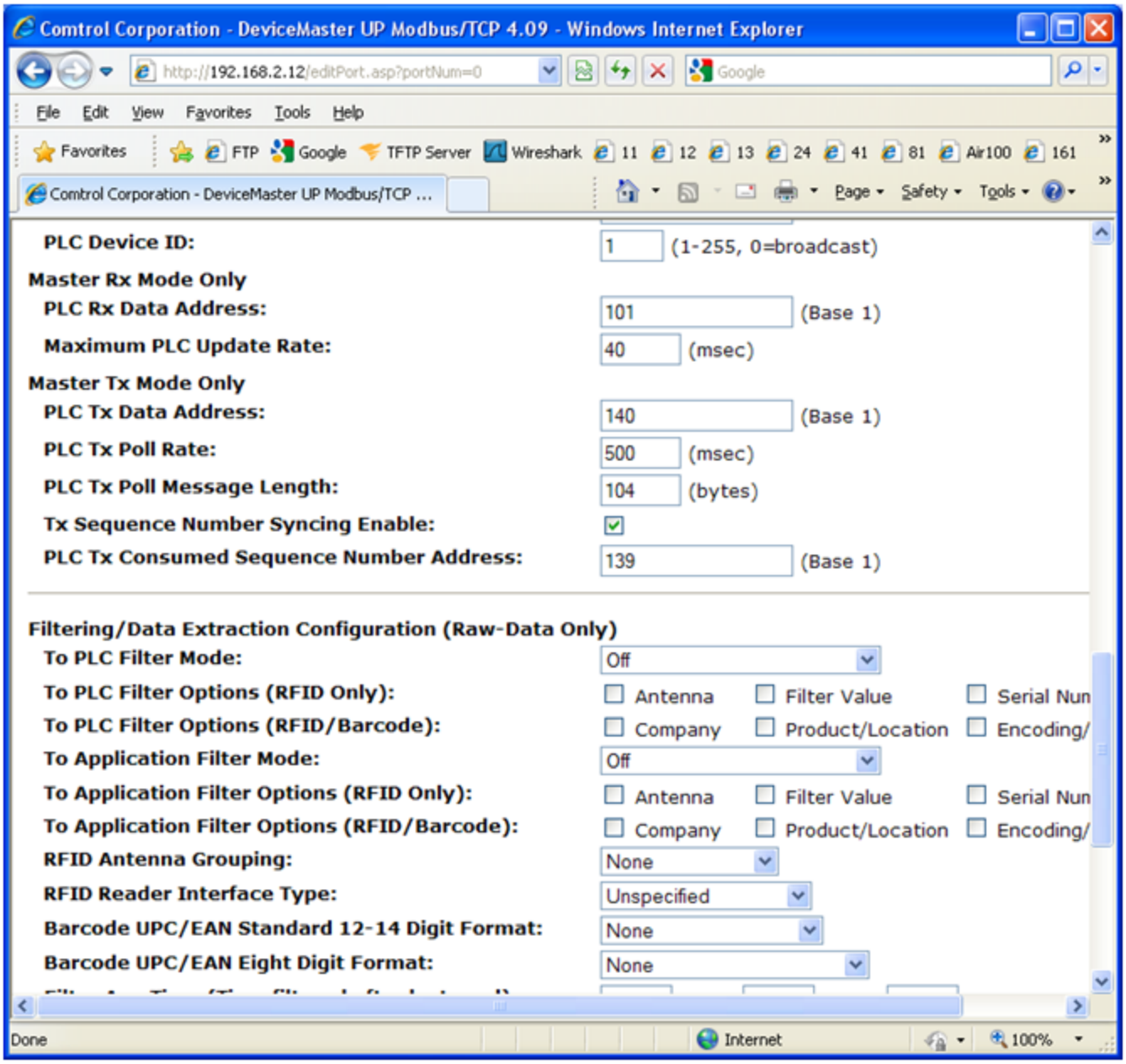
The PC Slave application is used on a Windows XP system with the following IP settings:
IP Address: 192.168.2.20
Subnet Mask: 255.255.0.0
Gateway Address: 192.168.0.254

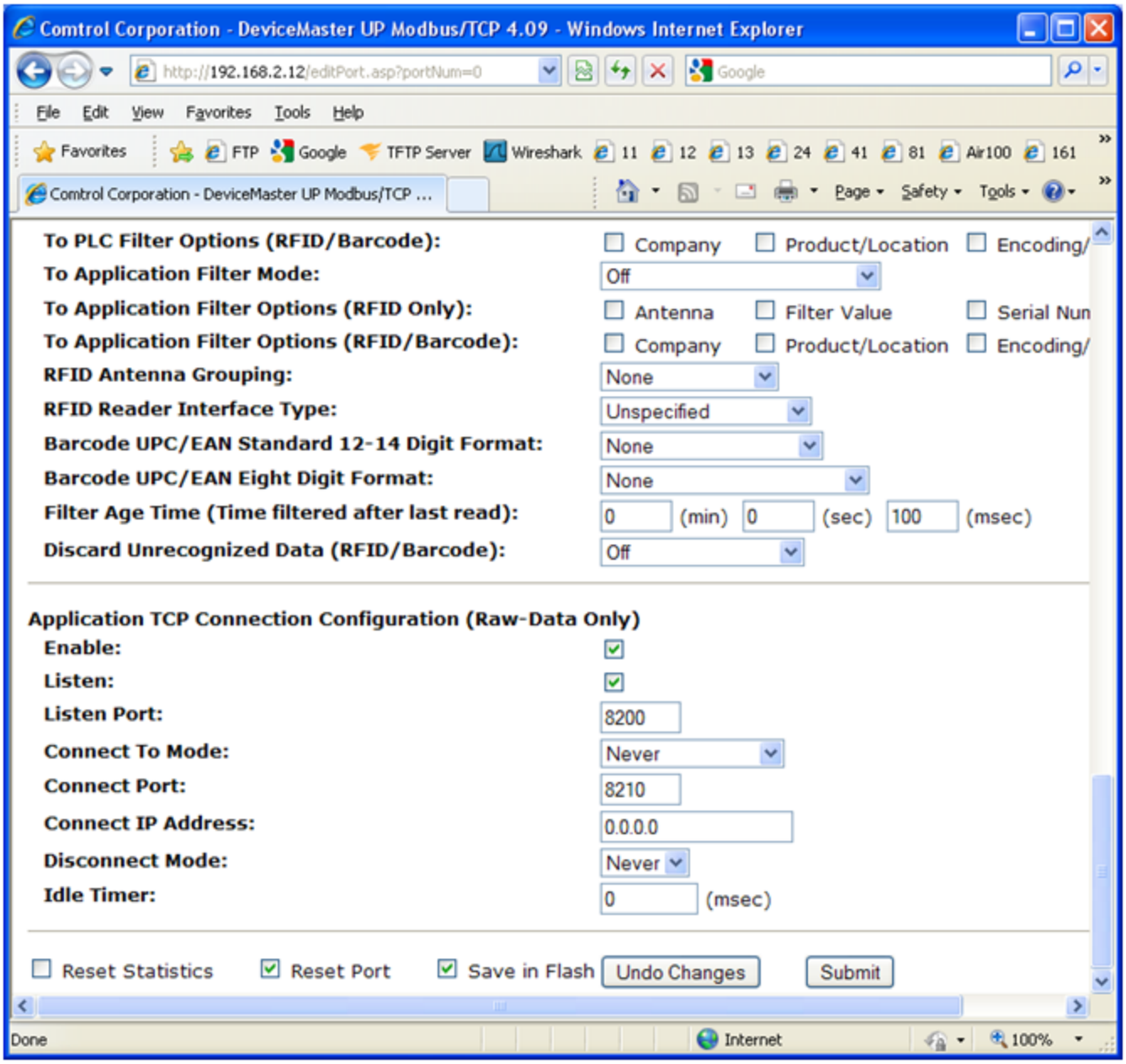
You should configure the IP information to be compatible with your network and then substitute your values in place of the values shown in this example.

Here are the serial port settings.




Comtrol Corporation - DeviceMaster UP Modbus/TCP 4.09 - Windows Internet Explorer
http://192.168.2.12/editPort.asp?portNum=0
Google
File Edit View Favorites Tools Help
Favorites FTP Google TFTP Server Wireshark 11 12 13 24 41 81 Air100 161
Comtrol Corporation - DeviceMaster UP Modbus/TCP ...
Page Safety Tools
ETX (End of Transmission) Rx Detect: two bytes Byte 1: 13 Byte 2: 10 (dec)
PLC Specific Settings
STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)
ETX (End of Transmission) Tx Append: two bytes Byte 1: 13 Byte 2: 10 (dec)
Strip Rx STX/ETX:
Application Specific Settings
STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)
ETX (End of Transmission) Tx Append: two bytes Byte 1: 13 Byte 2: 10 (dec)
Strip Rx STX/ETX:
Modbus/TCP Settings (Raw-Data Only)
Rx (To PLC) Transfer Mode: Master (Write to PLC)
Tx (From PLC) Transfer Mode: Master (Poll the PLC)
Maximum Rx Data Packet Size: 246 (bytes)
Oversized Rx Packet Handling: Truncate
Rx MS Byte First:
Tx MS Byte First:
Disable Non-Filtered To PLC Rx Queue:
Master Rx/Tx Modes
PLC IP Address: 192.168.2.20
PLC Device ID: 1 (1-255, 0=broadcast)
Master Rx Mode Only
PLC Rx Data Address: 101
Done
Internet
100%


Comtrol Corporation - DeviceMaster UP Modbus/TCP 4.09 - Windows Internet Explorer
http://192.168.2.12/editPort.asp?portNum=0
Google
File Edit View Favorites Tools Help
Favorites FTP Google TFTP Server Wireshark 11 12 13 24 41 81 Air100 161
Comtrol Corporation - DeviceMaster UP Modbus/TCP ...
Page Safety Tools
PLC Device ID: 1 (1-255, 0=broadcast)
Master Rx Mode Only
PLC Rx Data Address: 101 (Base 1)
Maximum PLC Update Rate: 40 (msec)
Master Tx Mode Only
PLC Tx Data Address: 140 (Base 1)
PLC Tx Poll Rate: 500 (msec)
PLC Tx Poll Message Length: 104 (bytes)
Tx Sequence Number Syncing Enable:
PLC Tx Consumed Sequence Number Address: 139 (Base 1)
Filtering/Data Extraction Configuration (Raw-Data Only)
To PLC Filter Mode: Off
To PLC Filter Options (RFID Only): Antenna Filter Value Serial Nun
To PLC Filter Options (RFID/Barcode): Company Product/Location Encoding/
To Application Filter Mode: Off
To Application Filter Options (RFID Only): Antenna Filter Value Serial Nun
To Application Filter Options (RFID/Barcode): Company Product/Location Encoding/
RFID Antenna Grouping: None
RFID Reader Interface Type: Unspecified
Barcode UPC/EAN Standard 12-14 Digit Format: None
Barcode UPC/EAN Eight Digit Format: None
Done
Internet
100%



DeviceMaster:
Modbus/TCP Settings (Raw-Data Only)
Rx (To PLC) Transfer Mode: Master (Write to PLC)
Tx (From PLC) Transfer Mode: Master (Poll the PLC)
Ip address: 192.168.2.12
Subnet mask: 255.255.0.0
Gateway address: 192.168.0.254

PC:
IP address: 192.168.2.20
Subnet mask: 255.255.0.0
Gateway address: 192.168.0.254

Attach the DeviceMaster Loopback Plug to the serial DB9 port

Modbus Slave Configuration

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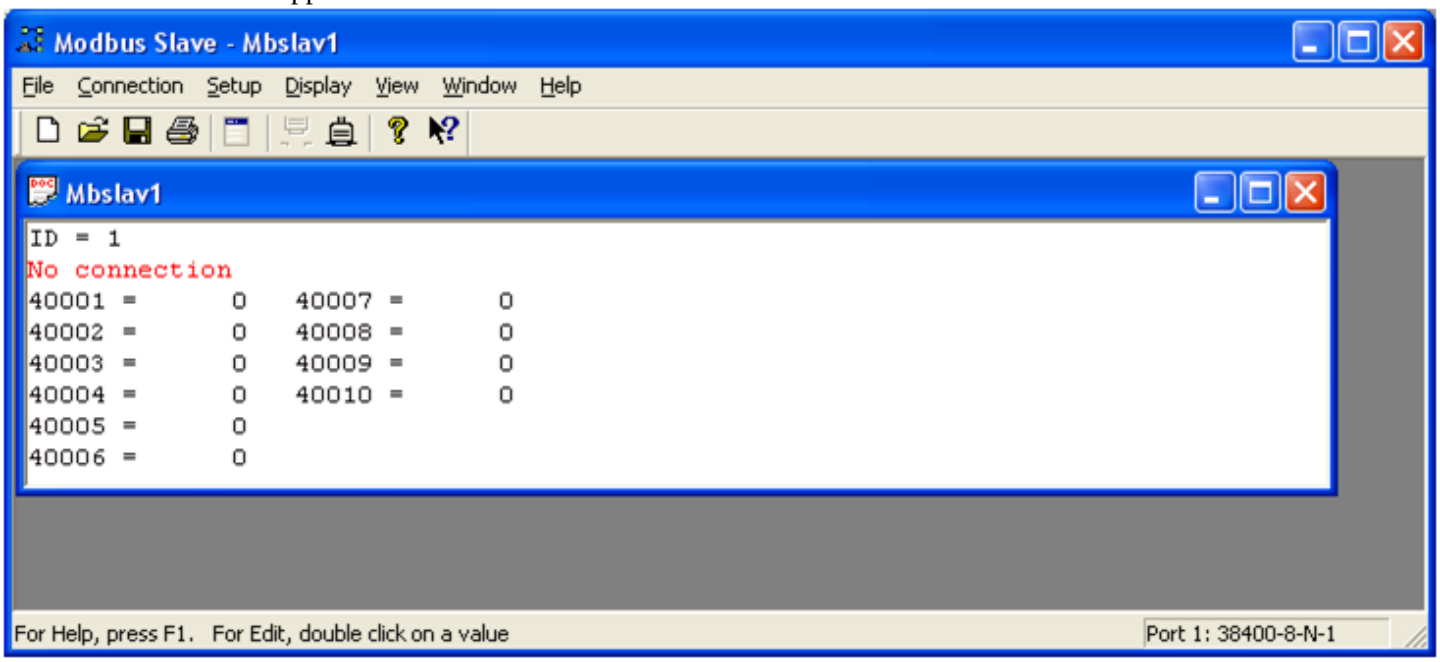
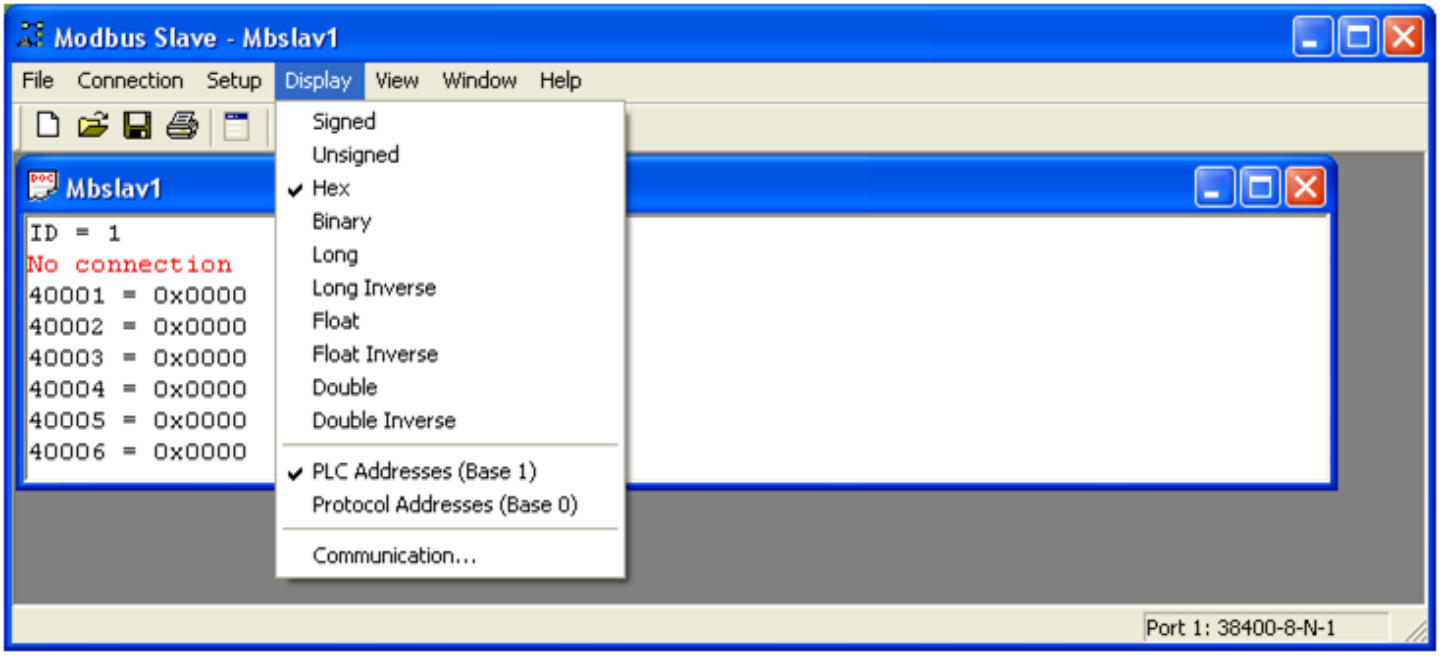
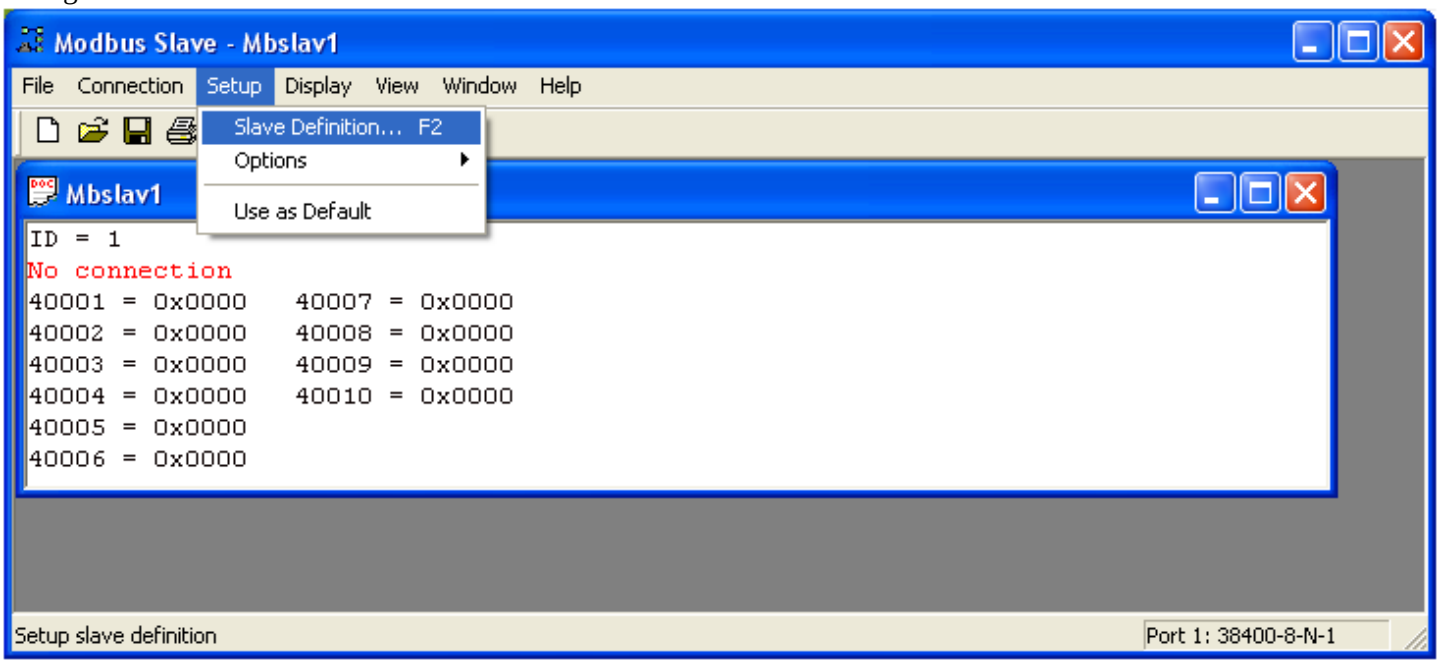
Start the Modbus Slave app.

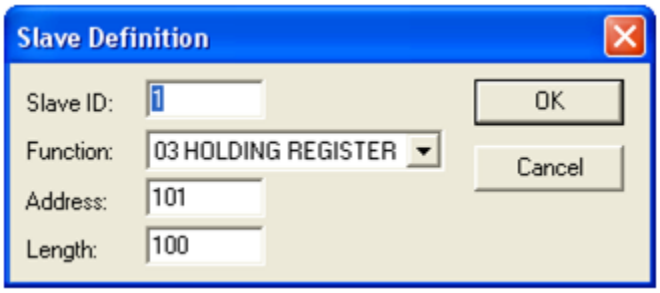


Configure the Display as shown here:



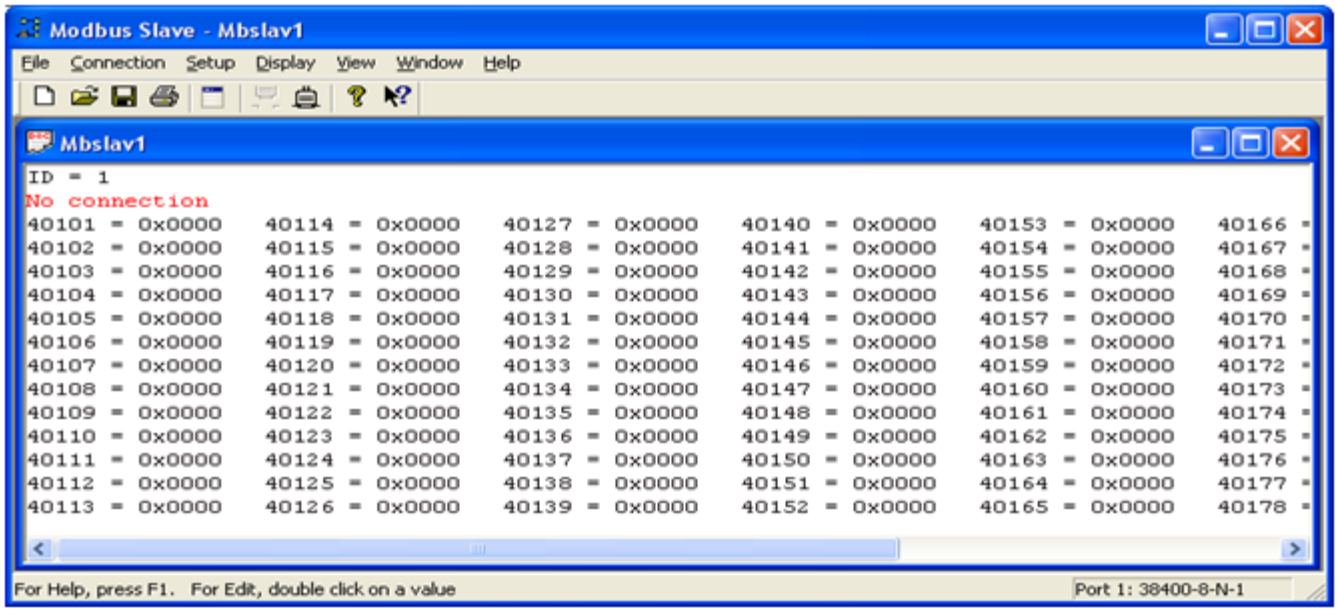
Configure the Slave Definition:



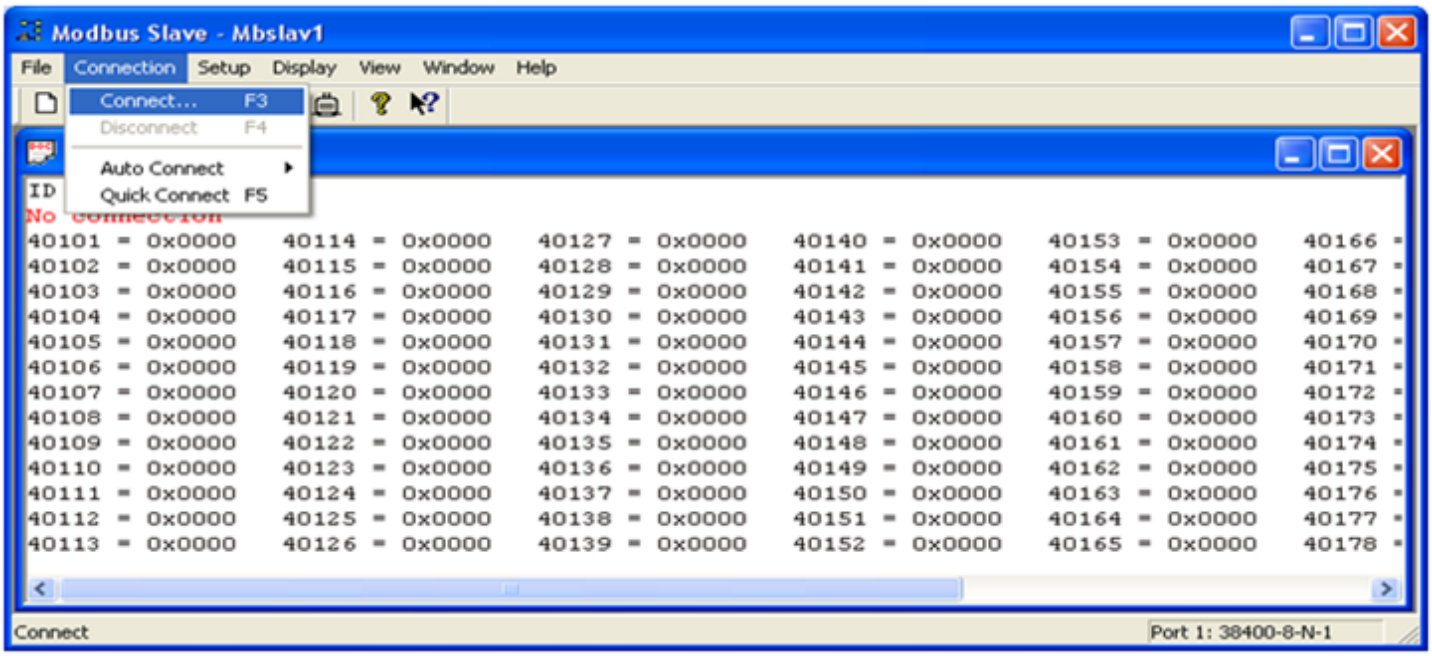


Leave the Slave ID at the default of 1.
Change the Address: from 1 to 101
Change the Length: from the default 10 to 100

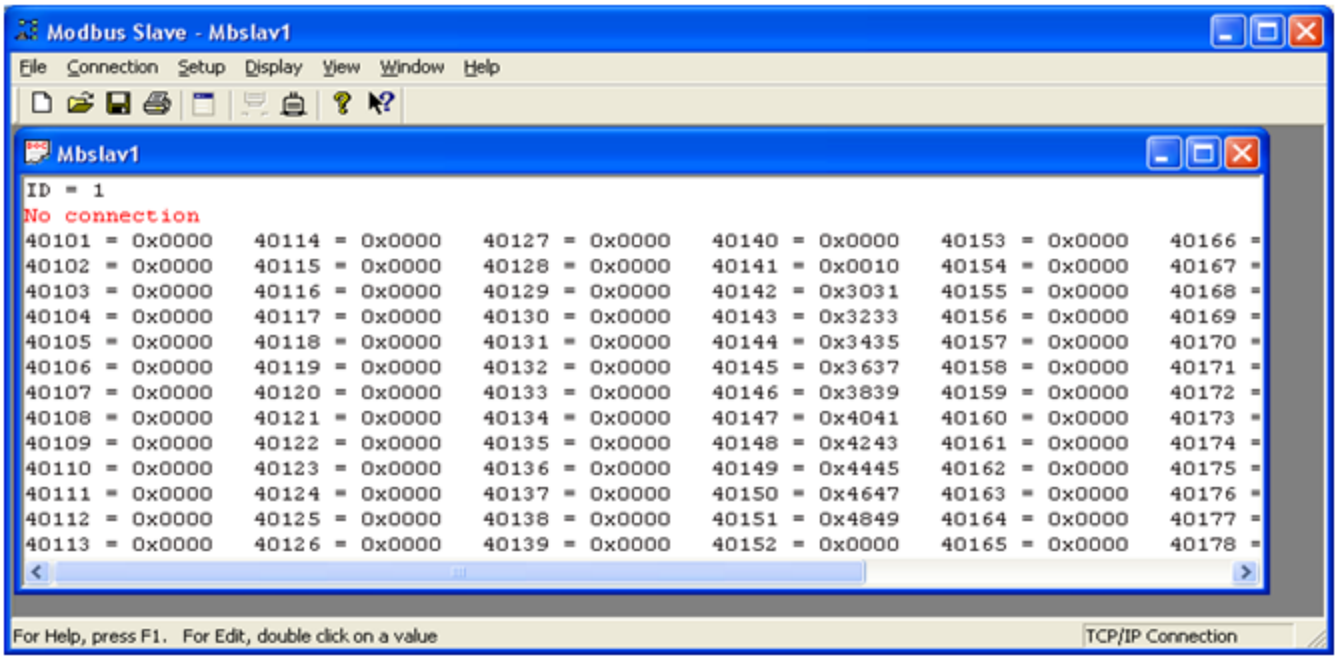
It will display No connection at this time.

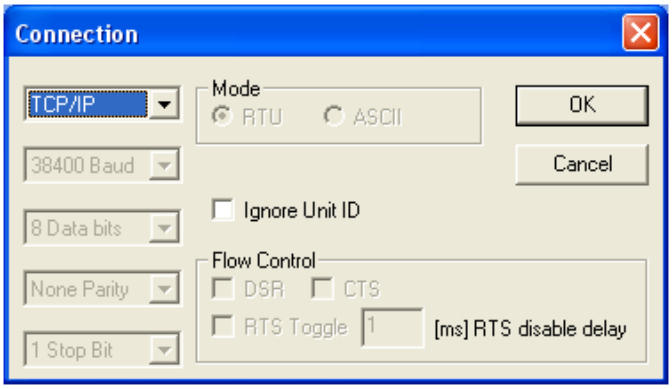


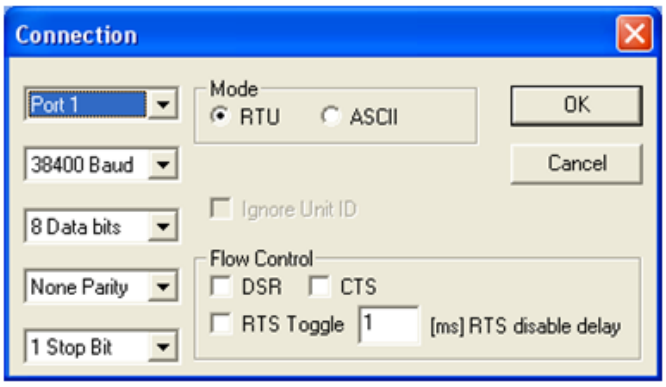
Configure the Connection



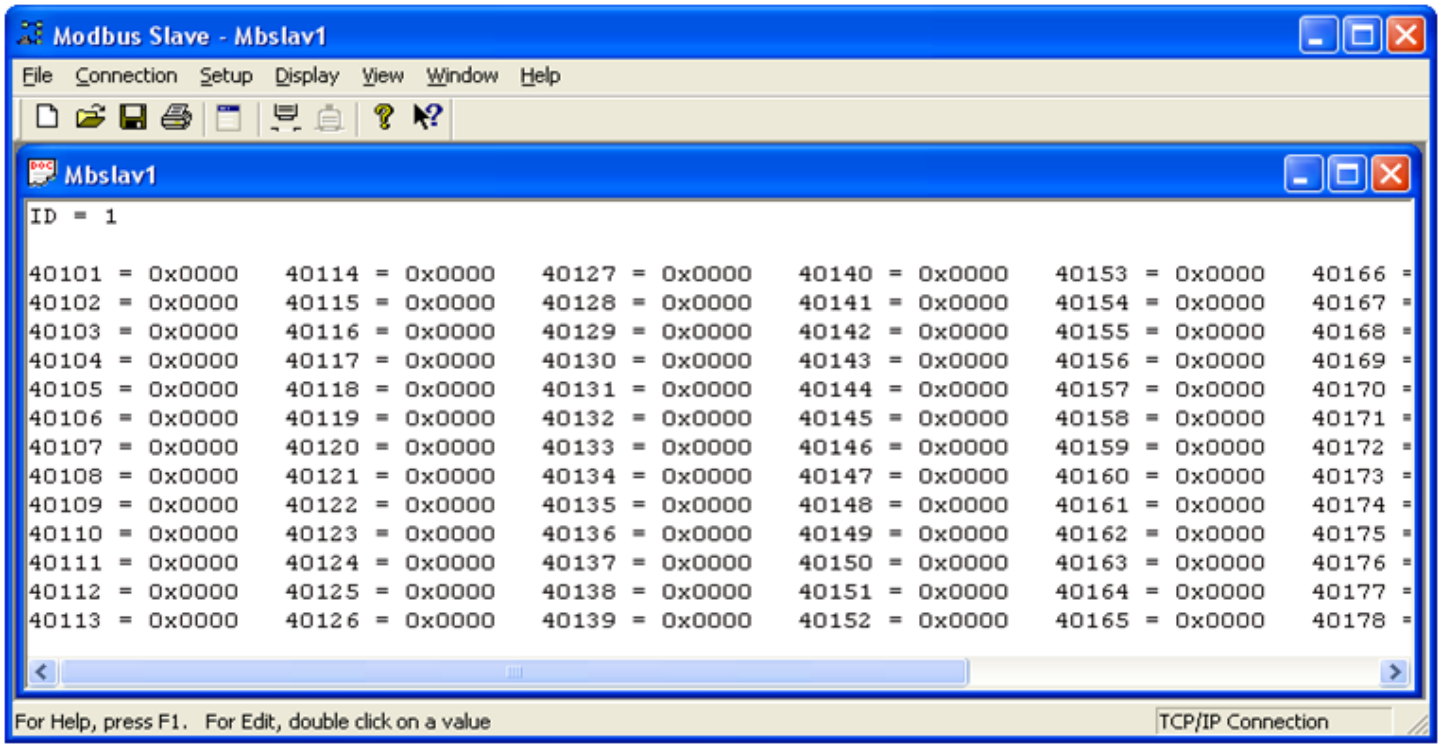
Set the following registers as shown here (for edit, double click on a value):
Registers 40140 is set to 0 = sequence counter. This register will be manually incremented
Registers 40141 is set to the length of the data = 10
Registers 40142 is set to 3031 = ASCII 0 1
Registers 40143 is set to 3233 = ASCII 2 3
Registers 40144 is set to 3435 = ASCII 4 5
Registers 40145 is set to 3637 = ASCII 6 7
Registers 40146 is set to 3839 = ASCII 8 9
Registers 40147 is set to 4041 = ASCII @ A
Registers 40148 is set to 4243 = ASCII B C
Registers 40149 is set to 4445 = ASCII D E
Registers 40150 is set to 4647 = ASCII F G (not transmitted as length set to 10)







Change the connection from Port 1 to read TCP
Click OK



Modbus Slave is now connected to the serial port on the DeviceMaster as shown by the absence of the No connection indicator.

Hyperterminal Configuration

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Test Terminal (WCom2)

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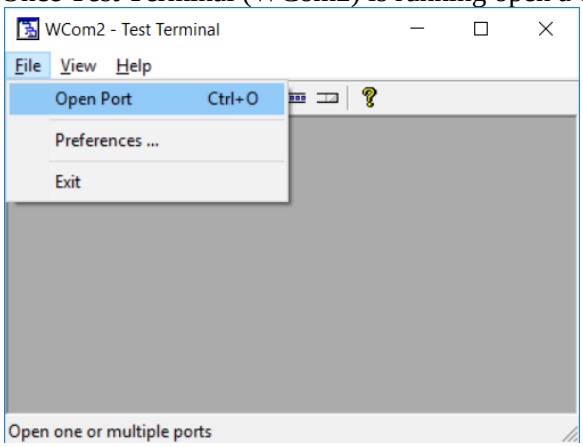
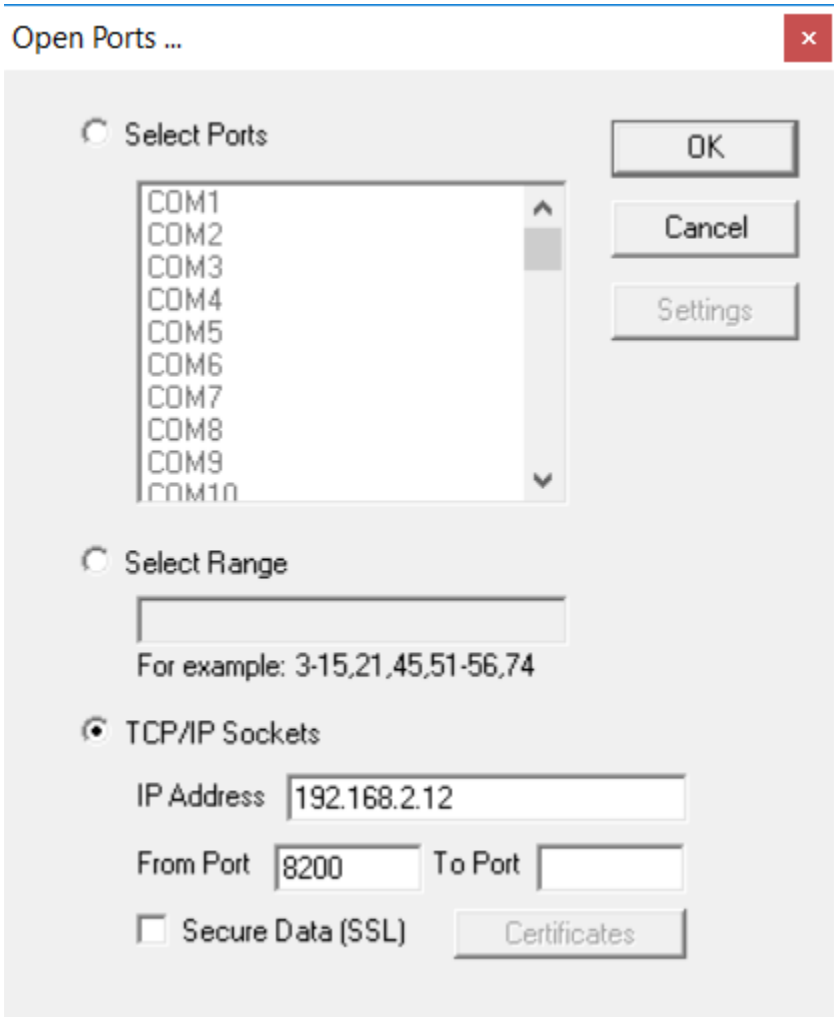
Download, install and launch Test Terminal (WCom2).
ftp://ftp.comtrol.com/utilities/windows/comtrol_utility/Comtrol_Utility_Package_V4.11.msi
Once Test Terminal (WCom2) is running open a com port:





Enter the IP Address of your DeviceMaster in the “TCP/IP Sockets” field
Enter the socket value of the serial port in the DeviceMaster. In this example the socket is 8200.
Click OK

Verification of Operation

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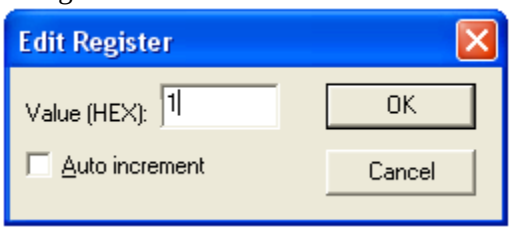
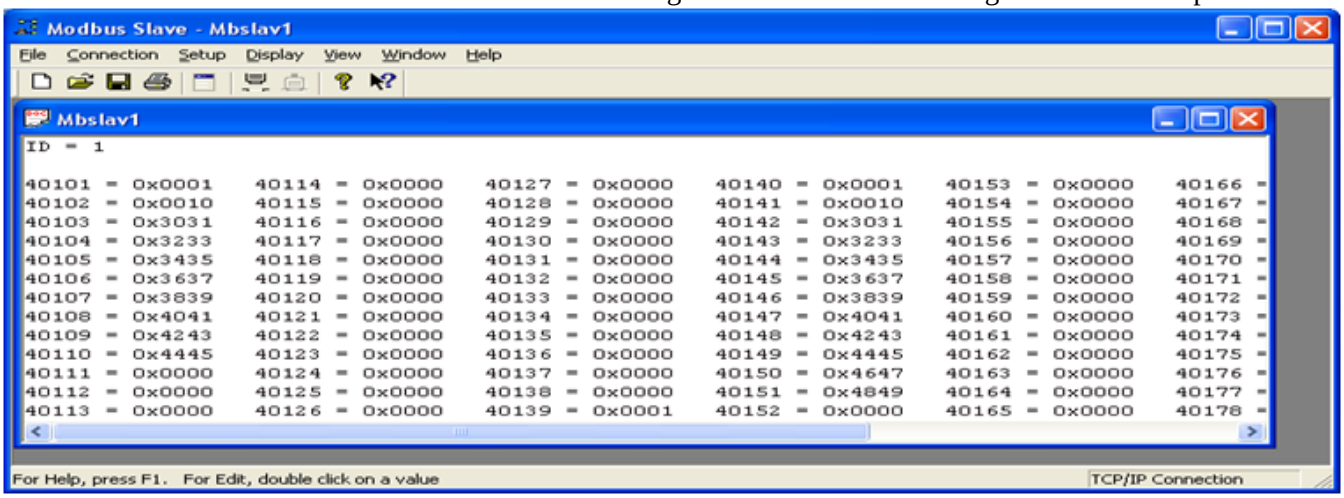
In Modbus Slave edit register 40140 (double click the 0x000 value)
Change data from 0 to 1



Click OK

The data will be displayed in Test Terminal (WCom2).

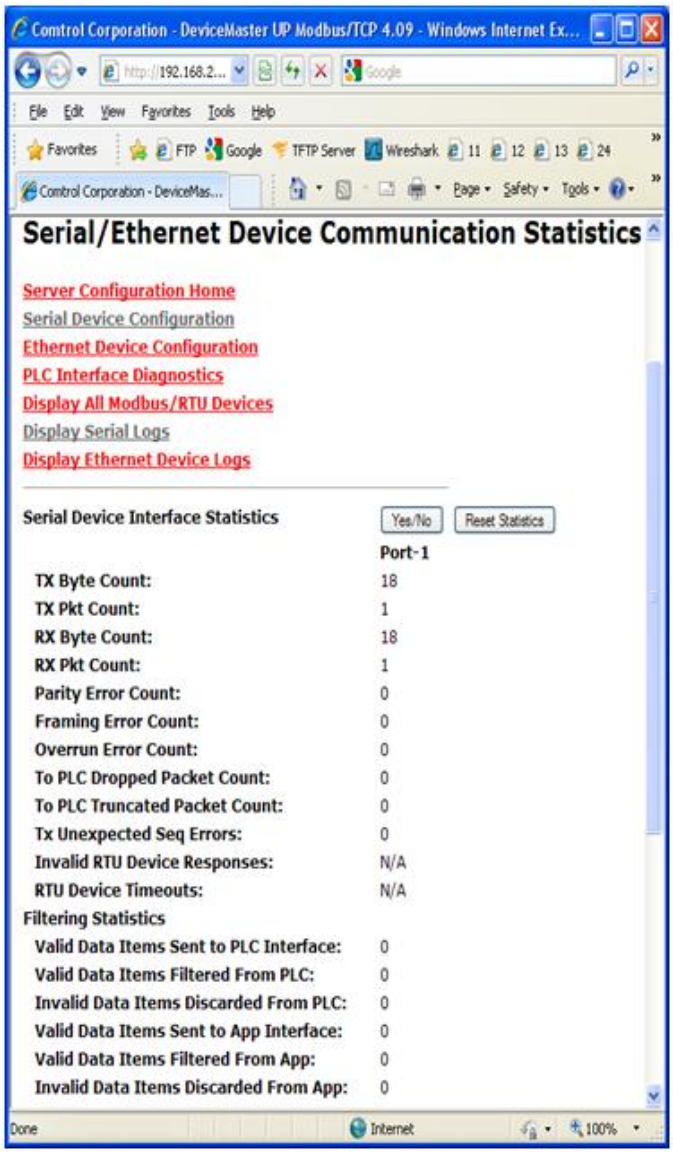
It will also be seen in Modbus Slave that the 40101 through 40110 values have changed to echo the input data.

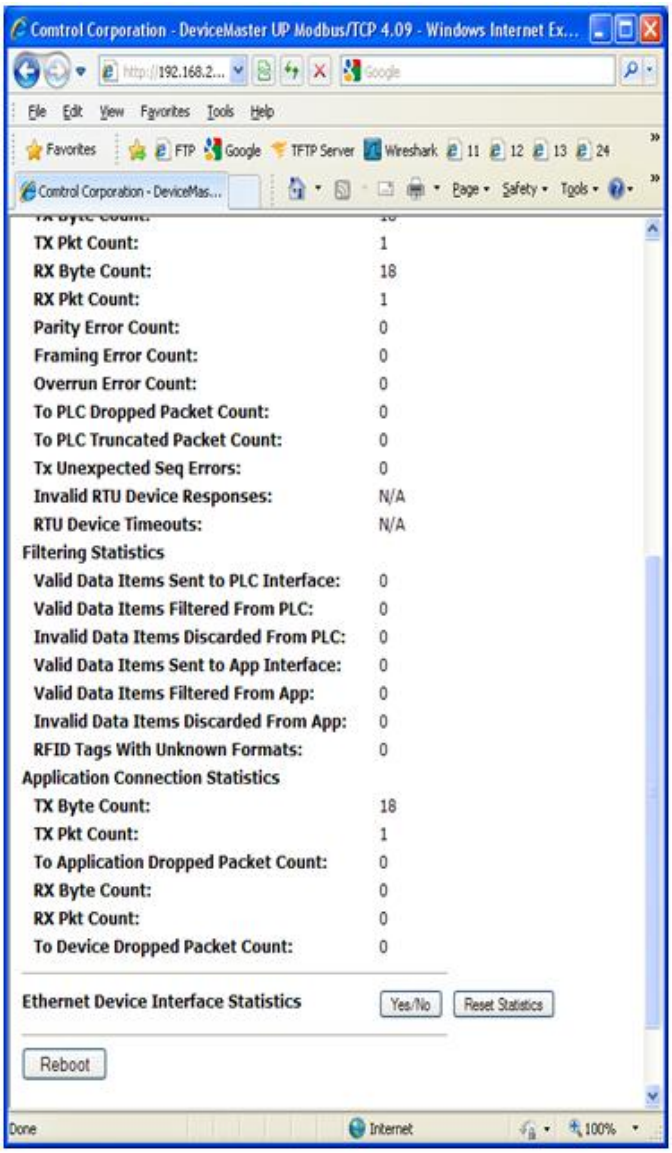


Also note the 40139 has echoed the sequence counter as consumed.
Open the web page of the DeviceMaster.
Go to the Display Serial Logs
When the web page is reviewed the data will also be displayed.

Note that there are both a Tx and Rx packet.

The communication statistics will also show valid counts.

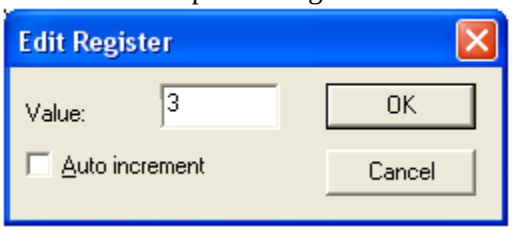




Change 40140 to a 2 and confirm all updated properly.

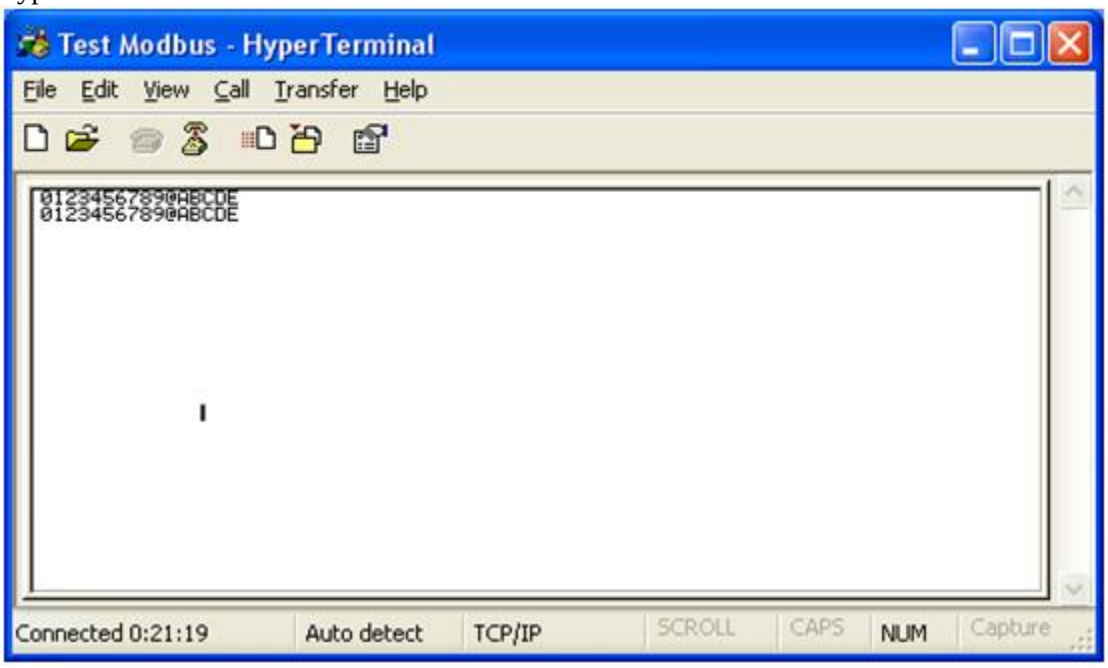
Click OK

Remove the Loopback Plug from the DeviceMaster serial port and change 40140 to a 3.

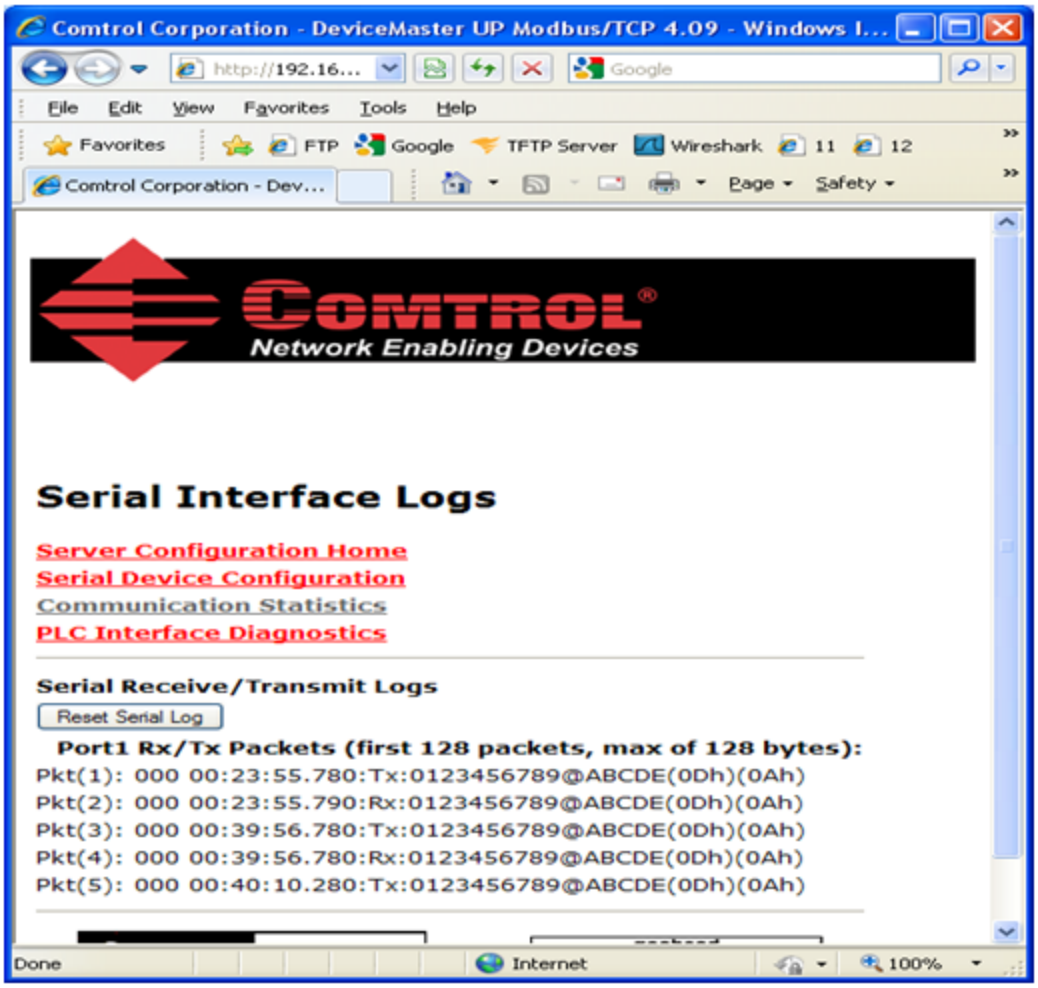


Click OK

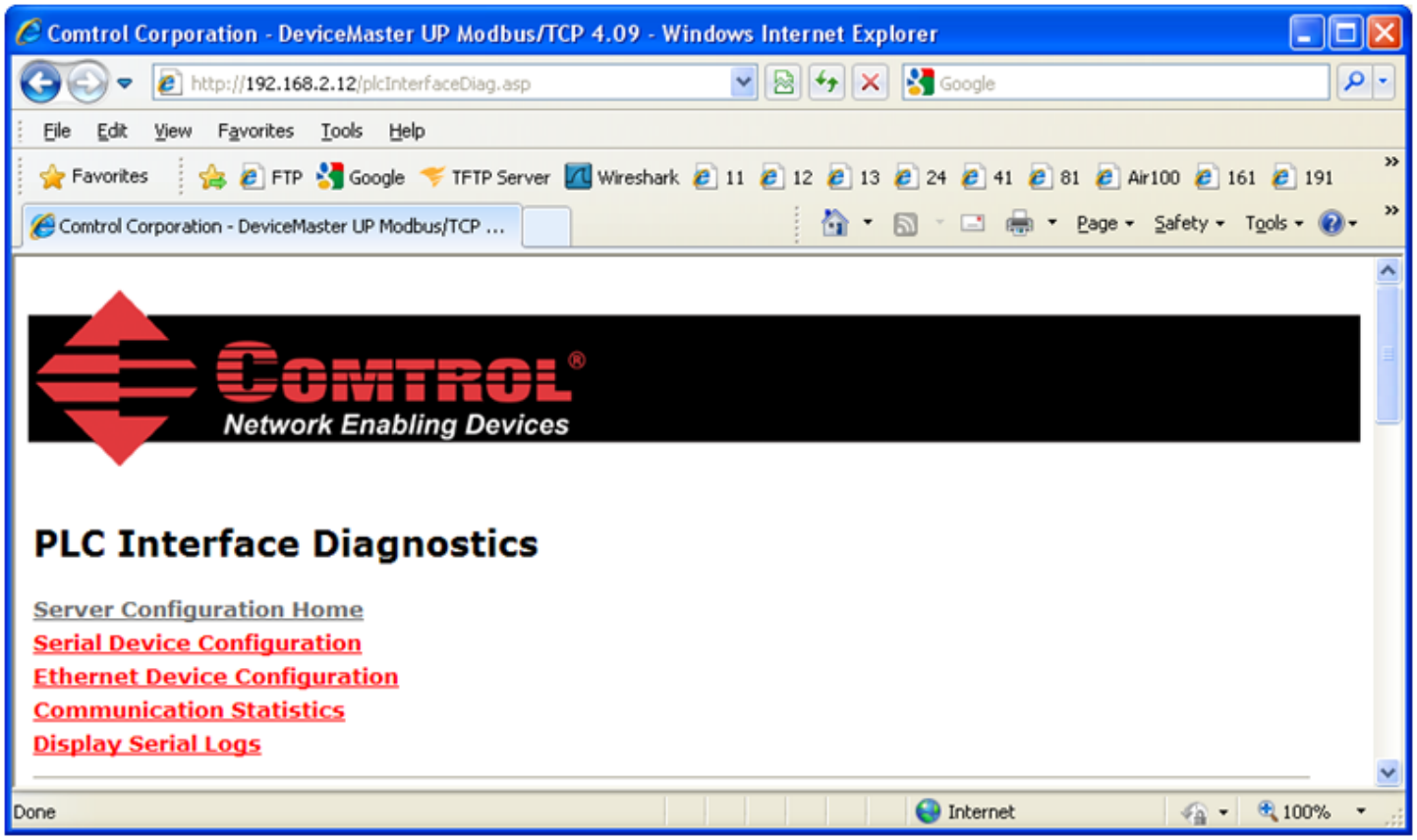
Inspect HyperTerminal (Test Terminal (WCom2) is used here instead of HyperTerminal, but the data will be as seen.)
HyperTerminal will NOT increment.

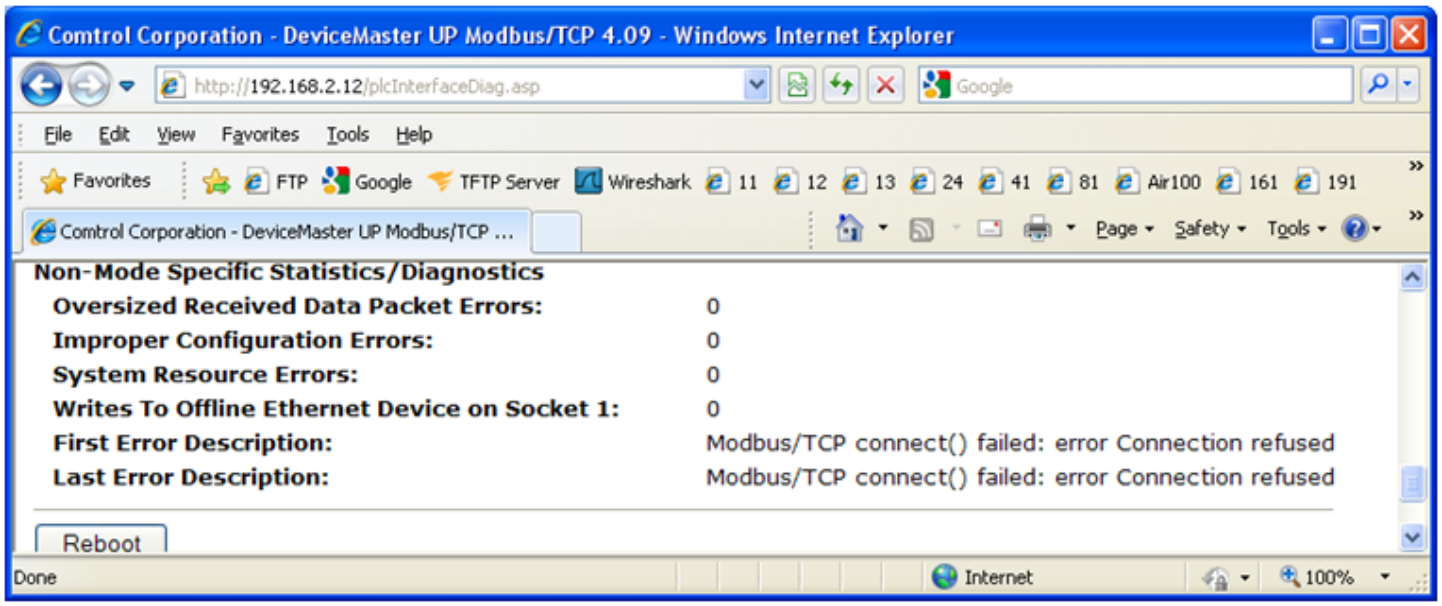


Serial Interface Logs will NOT show final Rx or Pkt(6)



The PLC Interface Diagnostics will show:





First Error Description and Last Error Description show a failed message.

This demonstrates that the Loopback Plug must be attached for the test to pass.
The Serial Device Configuration web page must also show the Mode: as RS-232

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