

NPort Real COM Mode for Modbus Applications

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1. Introduction

Modbus is a serial communications protocol originally published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). Modbus has become a standard protocol for TCP/IP networks, e.g. Modbus TCP. But some legacy applications can't support Modbus TCP. In this situation, when users want to extend their communication to TCP/IP networks, they can use NPort's Real COM Mode.

Real COM Mode can provide a virtual COM port on a computer, just as if it is on a computer's native serial port. Users can install the Real COM driver on the Modbus system, which creates an additional COM port. This serial port is mapped to the IP address of the remote NPort.

Hence, the NPort can be located at remote locations, eliminating costly modem connections while providing real-time access to Modbus RTU/ASCII slave devices via Ethernet (Figure 1).



Figure 1: System Topology

2. Applicable Products

Product Line

NPort 5000A

NPort 5000

Model Names

NPort 5100A series, NPort 5200A series, NPort 5400A series, NPort IA5250A

NPort 5100 series, NPort 5200 series, NPort 5400 series, NPort 5600 series, NPort IA5150, NPort IA5250

3. System Overview

In this example, we use the application "Modbus Poll" to simulate a Modbus master, and we use "Modbus Slave" to simulate a Modbus slave (Figure 2). These applications can be found at <http://www.modbustools.com>.

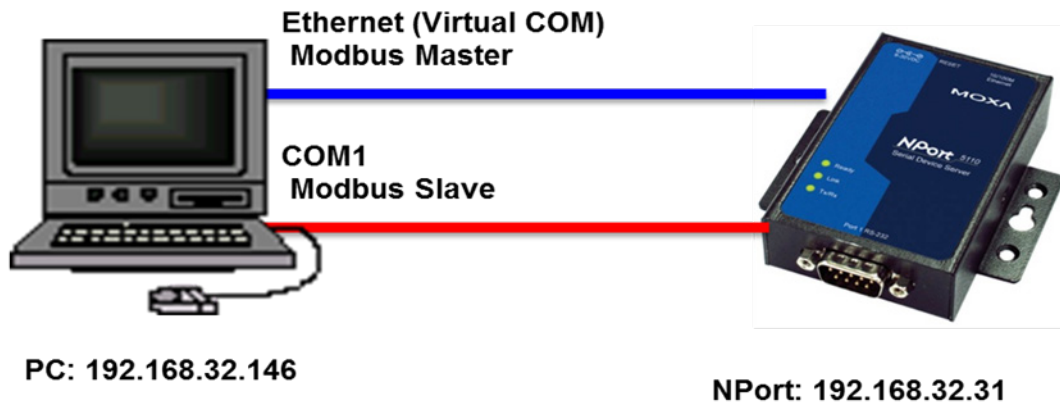


Figure 2: Demo topology

If you would like to use the Protocol Test Harness application, you can refer to this link: <http://www.trianglemicroworks.com/products/testing-and-configuration-tools/test-harness-pages>

4. NPort Settings

4.1. Mapping COM Port

Run "NPort Windows Driver Manager", then click "Add" to map the COM port of the NPort's Port 1 (Figure 3).

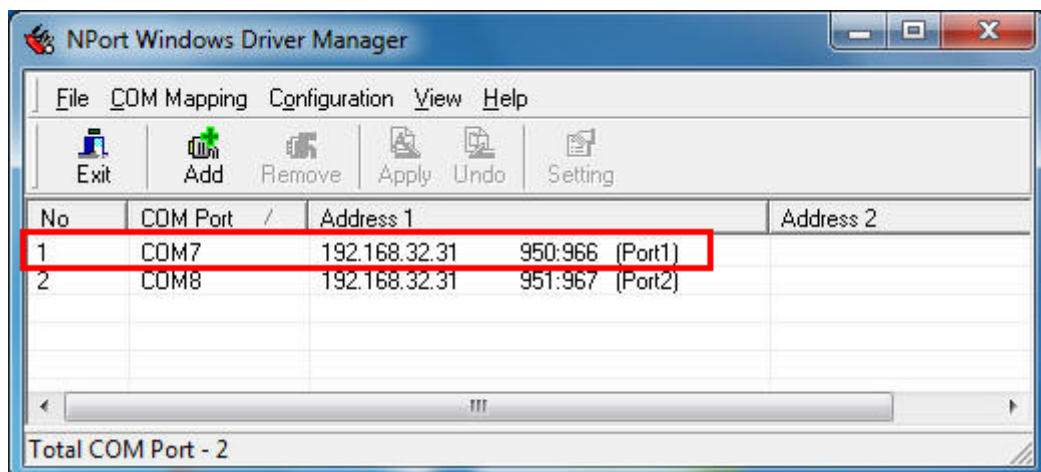


Figure 3: Mapping COM Port

4.2. Serial Settings

In the NPort web console, click "Serial Settings → Port 1" to set serial parameters as shown in Figure 4 below. Parameter settings should be the same as the Modbus slave settings.

Serial Settings	
Port=1	
Port alias	<input type="text"/>
Serial Parameters	
Baud rate	115200 ▾
Data bits	8 ▾
Stop bits	1 ▾
Parity	None ▾
Flow control	None ▾
FIFO	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Interface	RS-232 ▾
<input type="checkbox"/> Apply the above settings to all serial ports	
<input type="button" value="Submit"/>	

Figure 4: Serial Settings Parameters

4.3. Operation Mode Settings

In the NPort web console, click "Operation Settings → Port 1" to set operation mode. Select "Real COM Mode" and the NPort will provide the virtual COM port (Figure 5).

Operating Settings	
Port=1	
Operation mode	Real COM Mode ▾
TCP alive check time	7 (0 - 99 min)
Max connection	1 ▾
Ignore jammed IP	<input checked="" type="radio"/> No <input type="radio"/> Yes
Allow driver control	<input checked="" type="radio"/> No <input type="radio"/> Yes
Data Packing	
Packing length	0 (0 - 1024)
Delimiter 1	0 (Hex) <input type="checkbox"/> Enable
Delimiter 2	0 (Hex) <input type="checkbox"/> Enable
Delimiter process	Do Nothing ▾ (Processed only when Packing length is 0)
Force transmit	0 (0 - 65535 ms)
<input type="checkbox"/> Apply the above settings to all serial ports	
<input type="button" value="Submit"/>	

Figure 5: Operating Settings

5. Modbus Slave Settings

To input slave settings, run “Modbus Slave” application. Click “Setup → Slave Definition” and input slave settings as in Figure 6 below.

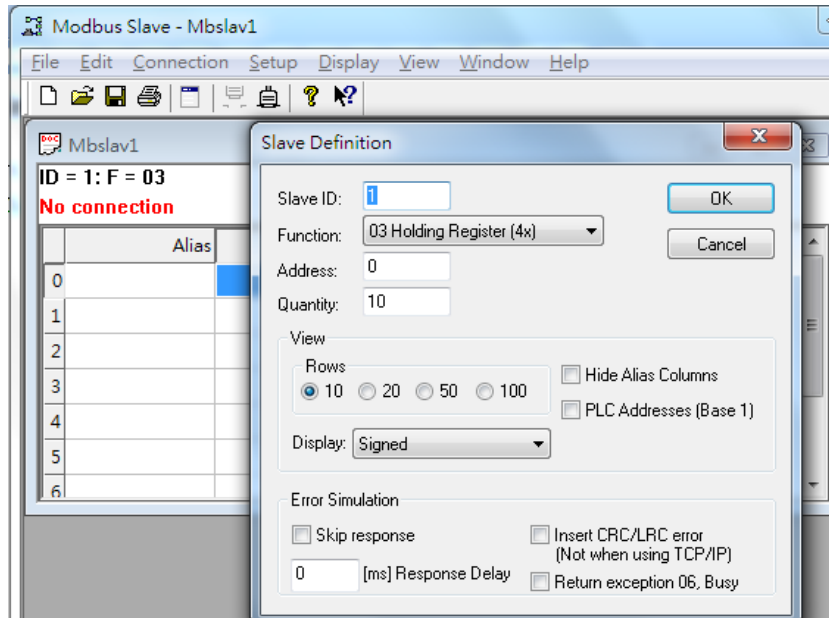


Figure 6: Slave Settings

Click “Connection → Connect” to set connection parameters and connect to Serial Port1 (COM1). This example is for Modbus RTU communication (Figure 7).

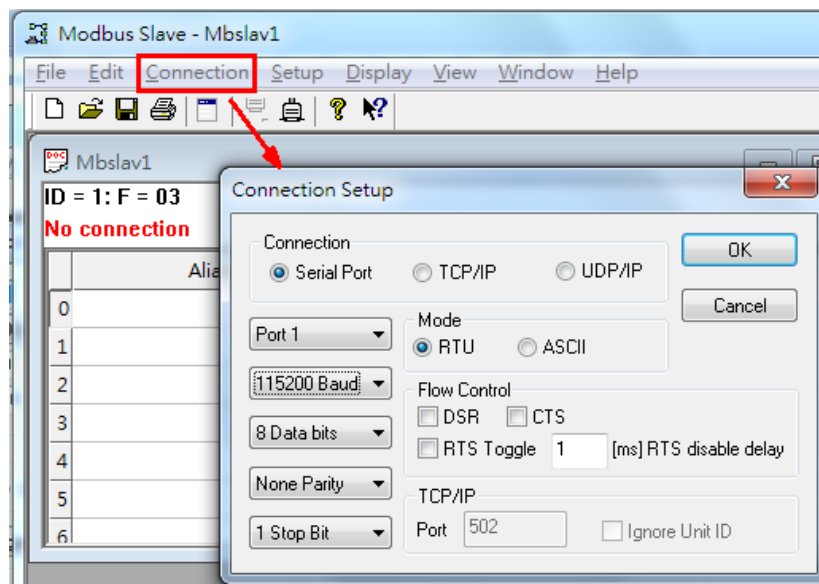


Figure 7: Connecting to Serial Port 1

6. Modbus Master Settings

To input Modbus master settings, run the “Modbus Poll” application. Click “Setup → Poll Definition” to set poll definition (Figure 8).

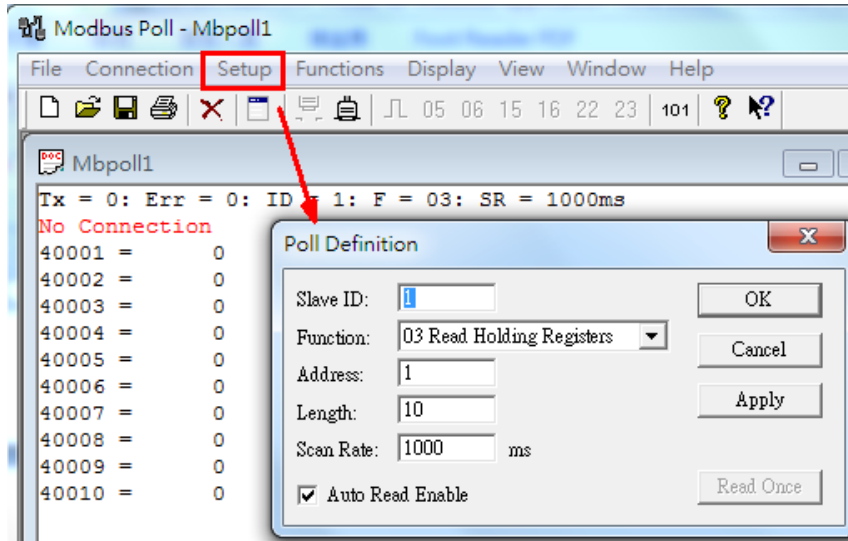


Figure 8: Setting Poll Definition

Click “Connection → Connect” to set connection parameters and connect to Serial Port 7 (COM7) which is NPort’s port1 mapping port. This example is for Modbus RTU communication (Figure 9).

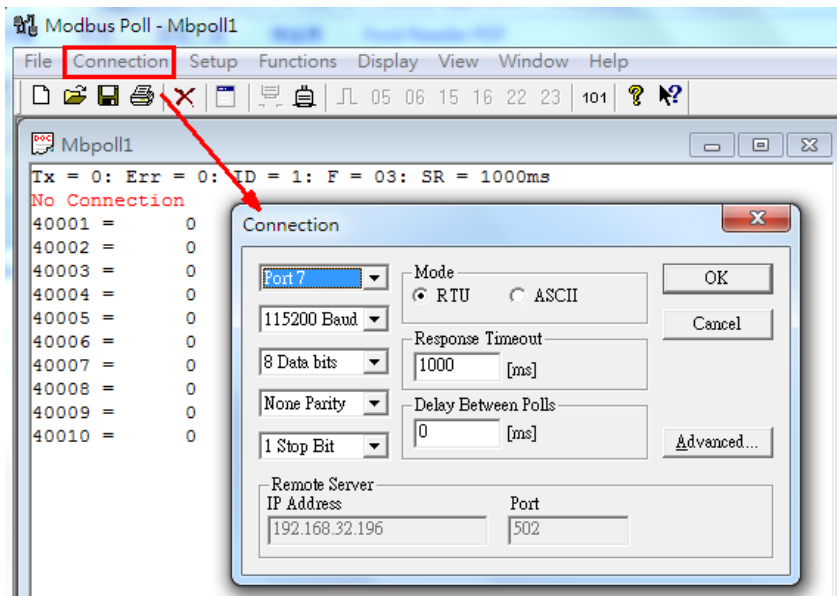


Figure 9: Connecting to Serial Port 7

7. Modbus Communication Verification

When Modbus Poll starts polling, if the Modbus slave responds correctly, the "Tx" count will be increasing. Otherwise the "Err" count will be increasing.

Additionally, we can change the Modbus slave register's value. For example, we can modify register 40001 value as "1234", and then Modbus Poll would get its updated value on the next polling (Figure 10).

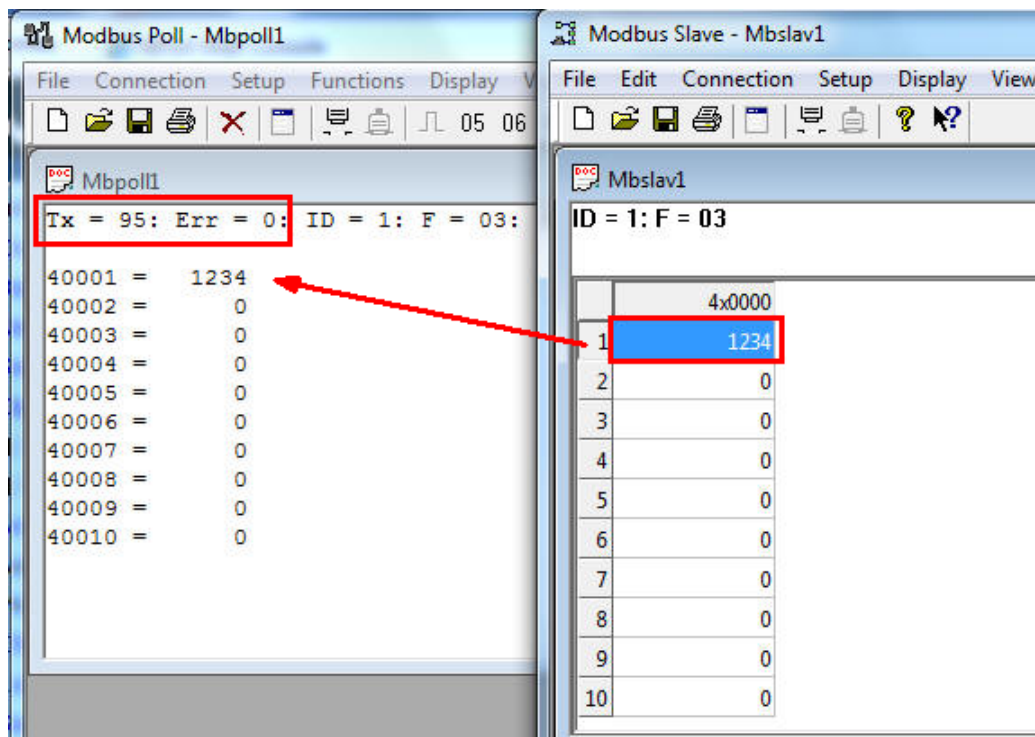


Figure 10: Changing the Modbus Slave Register Value