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](image)

2. Applicable Products

<table>
<thead>
<tr>
<th>Product Line</th>
<th>Model Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPort 5000A</td>
<td>NPort 5100A series, NPort 5200A series, NPort 5400A series, NPort IA5250A</td>
</tr>
<tr>
<td>NPort 5000</td>
<td>NPort 5100 series, NPort 5200 series, NPort 5400 series, NPort 5600 series, NPort IA5150, NPort IA5250</td>
</tr>
</tbody>
</table>
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.

![Diagram showing demo topology](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).

![Image of NPort Windows Driver Manager](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](image)

**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](image)

**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.

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

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

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).
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](image)