NPort's Ethernet Modem Mode

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Contents

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Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With 35 years of industry experience, Moxa has connected more than 82 million devices worldwide and has a distribution and service network that reaches customers in more than 80 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures. Information about Moxa's solutions is available at www.moxa.com.

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This Tech Note applies to the following NPort device server models:

- NPort DE-211
- NPort DE-311
- NPort DE-311M
- NPort 5100 Series
- NPort IA5150
- NPort IA5250
- NPort W2150 Plus
- NPort W2250 Plus
- NPort W2150A and NPort W2250A Series (wireless)
- NPort W2150A-W4/W2250A-W4 Series (wireless)
- NPort 6150
- NPort 6250
- NPort 6450
- NPort 6650

1   What is Ethernet Modem Mode?

Ethernet Modem mode provides true modem emulation, in which the NPort emulates a regular serial modem that accepts AT commands for dial-in/out service. When configured for Ethernet Modem mode, the NPorts will transmit raw data back and forth transparently.
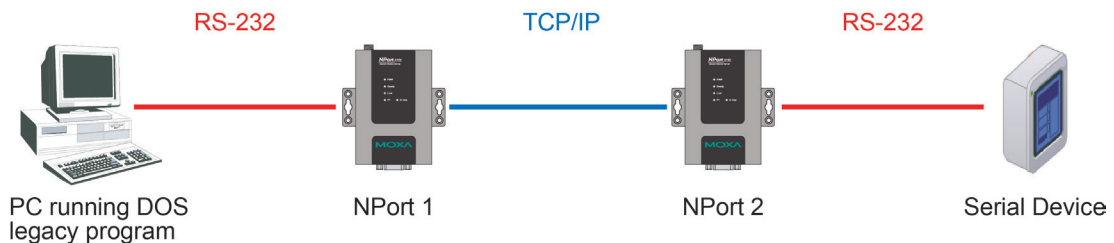
2   How to Configure Ethernet Modem Mode

Before starting the configuration process, press and hold the RESET button for 10 seconds to reset the NPort to factory default values.

2.1   NPort DE-211/DE-311/DE-311M

1. Power on the NPort and then wait until the Ready LED lights up in green.

2. For RS-232 data transmission, set the DE-311's DIP switches to **OFF-OFF-OFF**, and set the DE-211's DIP switches to **OFF-OFF-OFF-OFF**.

3. Connect the host PC and NPort to the network.

4. Adjust the IP/netmask combination of the host PC and NPort so that they are on the same subnet. The default values for the NPort are 192.168.127.254/255.255.255.0. PING from the host PC to the NPort to verify that the connection is active.

5. Issue the command **# telnet <NPort's IP>** to log in to the NPort's Telnet console.

6. Under **[OP_mode]** choose **[Ethernet Modem]** for the Application. Under "More settings" configure **[TCP port]** and **[Destination IP addr]** so that the two NPorts can connect to each other.

7. Open **[Serialport]** to define the serial parameters for your program and the NPort to match the attached serial device (e.g., 115200, N, 8, 1).

8. Select **[Restart]** to activate all settings.

2.2   NPort 5100/5400/5600 Series, NPort IA5150/IA5250

1. Power on the NPort and then wait until the Ready LED lights up in green.

2. Connect the host PC and NPort to the network.

3. Adjust the IP/netmask combination of the host PC and NPort so that they are on the same subnet. The default values for the NPort are 192.168.127.254/255.255.255.0. PING from the host PC to the NPort to verify that the connection is active.

4. Issue the command **# telnet <NPort's IP>** to log in to the NPort's Telnet console.

5. Open **Main menu > Operating settings > Port > Operating mode** and then select **[Ethernet Modem Mode]**. Next, define the **[Local TCP port]** for listening.

6. Open **Main menu > Serial settings > Port** to define the serial parameters for your program and NPort to match the attached serial device (e.g., 115200, N, 8, 1).

7. Select **[Save/Restart]** to activate all settings.

2.3   NPort 6150/6250/6450/6650, NPort W2150 Plus/A/-W4 and NPort W2250 Plus/A/-W4
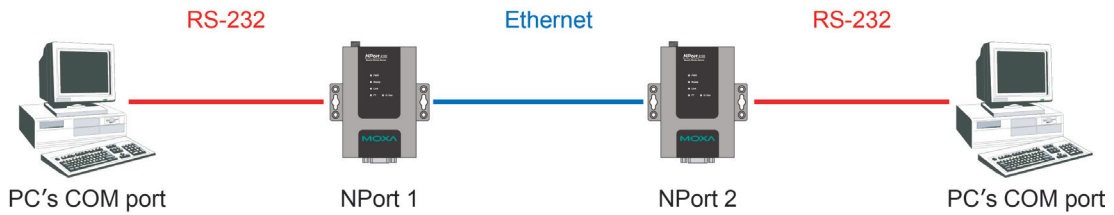
1. Power on the NPort and then wait until the Ready LED lights up in green.

2. Connect the host PC and NPort to the network.

3. Adjust the IP/netmask combination of the host PC and NPort so that they are on the same subnet. The default values for the NPort are 192.168.127.254/255.255.255.0. PING from the host PC to the NPort to verify that the connection is active.

4. Issue the command **# telnet <NPort's IP>** to log in to the NPort's Telnet console.

5. Open **[Port] > [Modes]** and set Application to **[Ethernet Modem]**. Next, define **[TCP port]** for listening.

6. Open **[Port] > [Line]** to define the serial parameters for your program and NPort to match the attached serial device (e.g., 115200, N, 8, 1).

7. Select **[Restart]** to activate all settings.

Note   For the NPort wireless Plus series, the Ethernet and WLAN connections cannot be used simultaneously. If the Ethernet port is connected, the WLAN will not work. If you would like to use the WLAN, be sure to unplug the Ethernet first.

Note   1. The default value of **[TCP port]** is 4001.

2. For the NPort DE-211/311/311M device servers, only those NPorts whose IP addresses are configured in the **[Destination IP addr]** column will be allowed to connect to this NPort. Leave this column empty to allow all other NPorts to connect to this NPort.

3. The NPort's default IP address for connecting to a wireless LAN is 192.168.126.254.

4. If the **DCD signal** is required for carrier detection, you will need to wire a special cable to connect the NPort's serial port to your device or PC as shown below:

```
DTE/ Device        NPort
Tx     -----------------Rx
Rx     -----------------Tx
CTS    -----------------RTS
RTS    -----------------CTS
DTR    ---------|     DCD
DSR    ---------|--------DSR
DCD    -----------------DTR
GND    -----------------GND
```

3   How to Test Ethernet Modem Mode

RS-232   Ethernet   RS-232

PC's COM port   NPort 1   NPort 2   PC's COM port

[Dial-in] at NPort #2

The NPort listens for a TCP/IP connection request from the remote Ethernet modem or host. The NPort's response depends on the ATS0 value, as explained below:

ATS0=0 (default)	The NPort will temporarily accept the TCP connection and then send a "RING" signal out through the serial port. The serial controller must reply with "ATA" within 2.5 seconds to accept the connection request, after which the NPort enters data mode. If no "ATA" command is received, the NPort will disconnect after sending three "RING" signals.
ATS0>=1	The NPort will accept the TCP connection immediately and then send the "CONNECT <baud>" command to the serial port, in which <baud> represents the baud rate of the NPort's serial port. The NPort will then immediately enter data mode.

Example 1:

You can send AT Commands to NPort #2 via HyperTerminal as shown below:

AT Command	NPort Response	Description
AT	OK	Test
ATS0=1	OK	Ring to auto-answer

[Dial-out] at NPort #1

The NPort accepts the AT command **ATD <IP>:<TCP port>** from the serial port and then requests a TCP connection from the remote NPort configured for Ethernet Modem mode. <IP> represents the IP address of the remote Ethernet modem or PC, and <TCP port> is the TCP port number of the remote Ethernet modem or PC. Once the remote device accepts this TCP connection, the NPort will send the "CONNECT <baud>" signal via the serial port and then enter data mode.

Example 2:

You can send AT Commands to NPort #1 via HyperTerminal as shown below:

AT command	NPort response	Description
AT	OK	Test
ATDT 192.168.127.254:4001	CONNECT 115200	Dial up the IP address & Port No.

[Disconnection request]

When the NPort is in data mode, users can send "+++" from the local serial port to the NPort to put the NPort into command mode. Enter the command **ATH** to shut down the

TCP connection. Instead, you may also drive the **DTR signal to OFF** to shut down the TCP connection. The NPort will return **NO CARRIER** through its serial port after 1 second.

Example 3:

You can send AT Commands to NPort #1 or NPort #2 via HyperTerminal as shown below:

AT command	NPort response	Description
+++	OK	Enter command mode
ATH	OK; NO CARRIER	ATH0=On-hook (default)