

NPort Server Lite/Pro

Firmware Configuration Guide

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password: *your_email_address*

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Installation and Configuration

Server Configuration

The following figure shows the basic parameters that must be set up before you can begin using your NPort Server. Refer to the table below the figure for details on the meaning of each parameter.

```
[ServerConfig] OP_mode Serialport Monitor Ping Restart Exit
Config server settings
ESC: back to menu Enter: select

Server Model          DE-3XX
Server Name           [HP21113 ]
Serial Number         21113

DHCP                  [Disable ]
Ethernet Status       1000 bps
MAC Address           00:09:E8:21:10:13
IP Address             [192.168.127.254]
Netmask                [255.255.255.0 ]
Gateway               [          ]

Password              [          ]
```

Server Configuration			
Setting	Value	Notes	Necessity
Server Model	DE-xxx	Set at the factory.	---
Server Name	alpha-numeric	This option is particularly useful when needing to specify the location or use of several different servers.	Optional
Serial Number	alpha-numeric	Set at the factory	---
DHCP	Disable/enable	Selecting the <i>enable</i> option allows a DHCP Server to automatically assign the server's IP address.	Optional

Ethernet Status	--	Indicating the Ethernet connection status	---
MAC Address	48-bit number	The MAC (Media Access Control) address is a unique identifier set at the factory.	---
IP Address	32-bit number, default = 192.168.127.254	The IP (Internet Protocol) address identifies the server on the TCP/IP network.	Required
Netmask	32-bit number, default = 255.255.255.0	Identifies the server as belonging to a Class A, B, or C network	Required
Gateway	32-bit number	IP address of the router that provides network access outside the server's LAN.	Required
Password	alpha-numeric	Console password	Optional

Choosing the Proper Operation Mode

In this section, we describe the various device server operation modes. The options include operation modes that use a driver installed on the host computer, operation modes that rely on TCP/IP socket programming concepts, and operation modes that typically involve communication between pairs of appropriately configured device servers.

Host Based Mode

Host Based Mode uses a Moxa supplied driver that establishes a *transparent* connection between host and serial device by creating a virtual local COM port on the host computer for each of the serial device server's serial ports. The important point is that Host Based Mode allows users to continue using RS-232/422/485 serial communications software that was written for pure serial communications applications. The driver intercepts data sent to the host's COM port, packs it into a TCP/IP packet, and then redirects it through the hosts Ethernet card. At the other end of the connection, NPort Server accepts the Ethernet frames, unpacks the TCP/IP packet, and then transparently sends it to the appropriate serial device attached to one of the device server's serial ports.

Single Host Mode

Single Host Mode is a natural extension of the host-to-device setup in which a serial device, such as a card reader, is connected directly to a PC's COM port. That is, one host is given the right to connect to the device server's attached serial devices, and data acquisition and control of these devices is limited to this one host. Single Host Mode is characterized by the following:

1. Single Host Mode restricts access control of the Device Server to only one host.
2. When using Single Host Mode, be sure to use Password Protection to guarantee secure access control by the host computer.

*NOTE: Any networked host has the power to wrest control of an NPort Server configured for Single Host Mode that is **not** password protected. Once a second host adds control of the NPort Server to its own system, the original host will thenceforth be denied access to the NPort Server.*

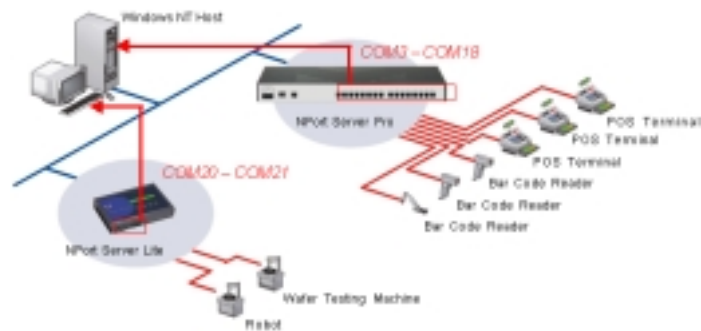


Fig. 1: Host Based Mode—Single Host Mode

Figure 1 illustrates a Host Based Mode topology that consists of one host, a 2-port NPort Server Lite, and a 16-port NPort Server Pro. For this type of setup, the one host is able to control the serial ports of up to 18 different serial devices located at two different sites.

Custom Mode

Custom Mode allows for more advanced communications topologies between remote hosts and serial devices connected to one or more NPort device servers. Using this operation mode, it is possible for several hosts to divide usage of a multiport device server's ports, or share the same port belonging to one particular device server. Custom Mode is characterized by the following:

1. Custom Mode allows several hosts to have access control of the same NPort Server.
2. When using Custom Mode, the system administrator can use NPort Manager to easily adjust the Access Control Table to control which hosts have access to which ports.



Fig. 2: Host Based Mode—Custom Mode

Figure 2 illustrates a Host Based Mode topology that consists of two hosts that share access to serial devices via one NPort Server Pro. In this case, half of the NPort Server's ports are relegated to Host A, and the other half are relegated to Host B.

Pair Connection Mode (DE-301/331 Only)

Pair Connection Mode employs two 1-port NPort Servers in tandem, and can be used to remove the 15 meter distance limitation imposed by the RS-232 interface. One NPort Server is connected from its RS-232 port to the COM port of the PC or other type of computer, such as hand-held PDAs that have a serial port, and the serial device is connected to the RS-232 port of the other NPort Server. The two NPort Servers are then connected to each other, both are connected to the same LAN, or in a more advanced setup, they communicate with each other over a WAN (i.e., through one or more routers). Pair Connection Mode can not only transparently transfer data, but also transparently transfer the full modem signal control between the two NPort Servers.

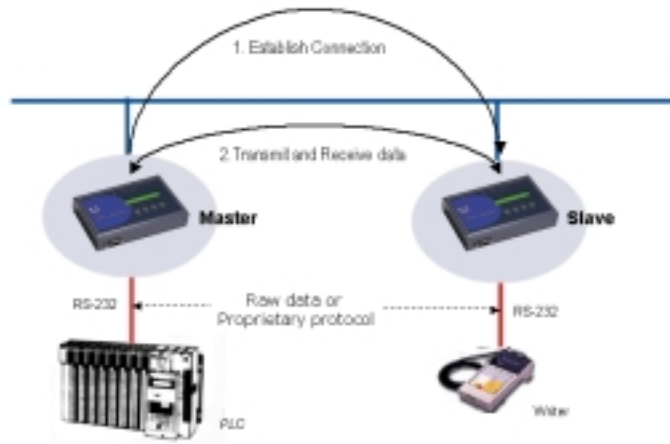


Fig. 3: Pair Connection Mode

Figure 3 illustrates a Pair Connection Mode topology that consists of two NPort Servers used to provide access to a serial device (in this case, the PLC). This example illustrates that access to the serial device can be provided to non-PC hosts, such as the Writer shown in the figure.

```
-----  
| Remote IP address : [           ] |  
| TCP alive check time: [ 7 ] minutes |  
-----
```

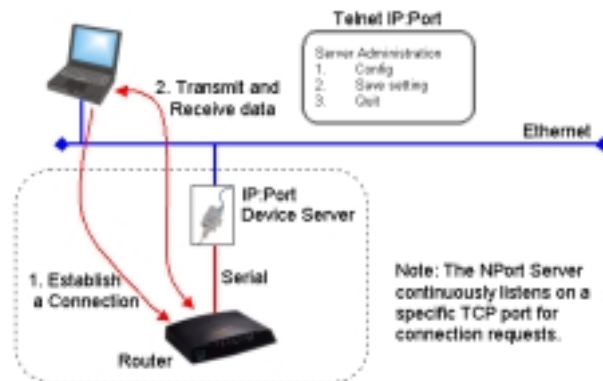
Pair Connection (Master)			
Setting	Value	Notes	Necessity
Remote IP address	valid IP	IP address of another NPort Server (configured for Pair Connection (Slave) mode) with which this NPort Server can request a connection.	Required
TCP alive check time	0	TCP connection is never closed by this device.	Optional
	1 – 99 min.	TCP connection is automatically closed by this device if there is no TCP activity for the given time.	
Pair Connection (Slave)			
Setting	Value	Notes	Necessity
Remote IP address	valid IP	Allows contact with only the specified remote IP address.	Optional
	<i>blank</i>	Allows contact with any remote Master.	
TCP alive check time	0	TCP connection is never closed by this device.	Optional
	1 – 99 min.	TCP connection is automatically closed by this device if there is no TCP activity for the given time.	

Raw Connection Mode

Raw Connection Mode consists of three different operation modes: TCP Server, TCP Client, and UDP Server/Client. Keep in mind that the main differences between TCP and UDP is that TCP guarantees delivery of data by requiring that the recipient sends an acknowledgement to the sender. UDP does not require this type of verification, making it possible to offer speedier delivery. UDP also allows multicasting of data to groups of IP addresses.

TCP Server

RAW Connection (TCP Server) operation mode is designed for use with serial devices that act as servers. That is, they passively wait for other devices to contact them and request that a TCP connection be established between the two devices. It also means that your application software acts as a Client, in that it can actively poll remote serial devices.



Note that leaving the **Destination IP address** option blank allows any remote networked device to request a connection. Inputting one IP address for this option means that only a remote device with that IP address is allowed to establish a TCP connection. We should also point out that the **Delimiter 1**, **Delimiter 2**, and **Force transmit** options are used to activate the optional Data Packing function.

```

+-----+
| TCP port      : [4001 ] |
| Destination IP addr : [      ] |
| Delimiter 1 (Hex) : [ ] |
| Delimiter 2 (Hex) : [ ] |
| Force transmit (ms) : [ ] |
| Inactivity time : [ ] ms(0-65535)|
| TCP alive check time: [7 ] minutes |
+-----+

```

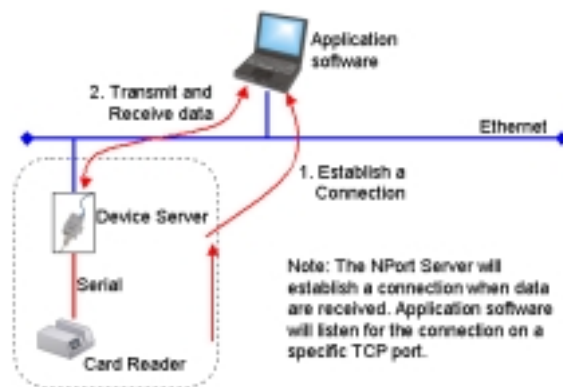
RAW Connection (TCP Server)			
Setting	Value	Notes	Necessity
TCP port	valid port number	The TCP port that other devices must use to contact this device. To avoid conflicts with standard TCP ports, the default is set to 4001.	Required
Destination IP addr	valid IP	Allows contact with only the specified remote IP address.	Optional
	<i>blank</i>	Allows contact with any remote networked device.	
Delimiter 1 (Hex)	ASCII code for the 1 st delimiter	Once the NPort Server receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort Server's Ethernet port. <i>Note: Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. *</i>	Optional
Delimiter 2 (Hex)	ASCII code for the 2 nd delimiter		Optional
Force transmit (ms)	<i>blank</i> (or 0)	Disabled.	Optional
	1 – 65535	Forces the device server's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame. *	

Inactivity time	<i>blank</i> (or 0)	Disabled.	Optional
	1 – 65535 ms	TCP connection is automatically closed by this device if the serial port is idle for the given time.	
TCP alive check time	0	TCP connection is never closed by this device.	Optional
	1 – 99 min.	TCP connection is automatically closed by this device if there is no TCP activity for the given time.	

* If the size of the received serial data is bigger than 1K, the device server will automatically pack the data and send it to the Ethernet.

TCP Client

The RAW Connection (TCP Client) operation mode is designed for use with serial devices that act as clients. That is, they actively request that a TCP connection be established with another device.



Note that the **Destination IP address** is a required option. This means that the device can only be set up to request service from one remote networked device. We should also point out that the **Delimiter 1**, **Delimiter 2**, and **Force transmit** options are used to activate the optional Data Packing function.

```

| Destination IP addr : [          ] |
| TCP port           : [4001 ] |
| TCP connect        : [Startup  ] |
| Delimiter 1 (Hex) : [    ] |
| Delimiter 2 (Hex) : [    ] |
| Force transmit (ms) : [    ] |
| Inactivity time    : [    ] ms(0-65535)|
| TCP alive check time: [7 ] minutes

```

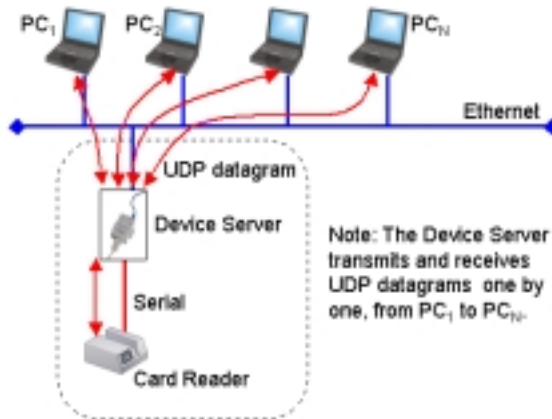
RAW Connection (TCP Client)			
Setting	Value	Notes	Necessity
Destination IP addr	valid IP	Allows connection with only the specified remote IP address.	Required
TCP port	valid port number	Specific TCP port through which the remote IP address is listening over the TCP connection.	Required
TCP connect	Startup	Attempts to establish a TCP connection as soon as the device server is powered on.	Required
	Any Character	Attempts to establish a TCP connection as soon as the device server starts receiving serial data.	
Delimiter 1 (Hex)	ASCII code for the 1 st delimiter	Once the NPort Server receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort Server's Ethernet port. <i>Note: Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. *</i>	Optional
Delimiter 2 (Hex)	ASCII code for the 2 nd delimiter		Optional

Force transmit (ms)	<i>blank</i> (or 0)	Disabled.	Optional
	1 – 65535	Forces the device server's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame. *	
Inactivity time	<i>blank</i> (or 0)	Disabled.	Optional
	1 – 65535 ms	TCP connection is automatically closed by this device if the serial port is idle for the given time.	
TCP alive check time	0	TCP connection is not closed due to an idle serial line.	Optional
	1 – 99 min.	TCP connection is automatically closed by this device if there is no TCP activity for the given time.	

* If the size of the received serial data is bigger than 1K, the device server will automatically pack the data and send it to the Ethernet.

UDP Server/Client

The UDP Server/Client operation mode is designed for applications that need speedier data transmission, or that make use of UDP's broadcast and multi-cast capabilities. Keep in mind that using UDP differs from TCP, in that a UDP transmission does not first require a connection to be opened before sending data, and the receiving party does not issue acknowledgements to the sender.



We should point out that the **Delimiter 1**, **Delimiter 2**, and **Force transmit** options are used to activate the optional Data Packing function.

	Begin	End	Port
(serial to LAN)			
Best. IP addr 1	[][][]
Best. IP addr 2	[][][]
Best. IP addr 3	[][][]
Best. IP addr 4	[][][]
(LAN to serial)			
Src. IP addr 1	[][]
Src. IP addr 2	[][]
Src. IP addr 3	[][]
Src. IP addr 4	[][]
Local Listen Port	:	[4001]	
Delimiter 1 (Hex)	:	[]	
Delimiter 2 (Hex)	:	[]	

RAW Connection (Server/Client)			
Setting	Value	Notes	Necessity
(serial to LAN)			
Dest. IP addr 1	A host or a group of hosts.	Data is sent from NPort to these remote IP addresses.	Required
Dest. IP addr 2			Optional
Dest. IP addr 3			Optional
Dest. IP addr 4			Optional
(LAN to serial)			
Src. IP addr 1	A host or a group of hosts.	Allows receipt of data from only these specified remote IP addresses.	Optional
Src. IP addr 2			Optional
Src. IP addr 3			Optional
Src. IP addr 4			Optional
Local Listen Port	valid port number	Used by the device server to listen for data coming in over the Ethernet line.	Required
Delimiter 1 (Hex)	ASCII code for the 1 st delimiter	Once the NPort Server receives both delimiters through its serial port, it immediately packs all data currently in its buffer and sends it out the NPort Server's Ethernet port. <i>Note: Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. *</i>	Optional
Delimiter 2 (Hex)	ASCII code for the 2 nd delimiter		Optional
Force transmit (ms)	<i>blank</i> (or 0)	Disabled.	Optional
	1 – 65535	Forces the device server's TCP/IP protocol software to try to pack serial data received during the specified time into the same data frame.	