# **NPort 5000 Series User Manual**

#### NPort 5000/5000A/IA5000/IA5000A/5000AI-M12 Series

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www.moxa.com/products



#### NPort 5000 Series User Manual

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Learn how to configure and use your Moxa NPort device server. The following products are covered by this manual:

NPort Family	Model Series	Introduction
NPort 5000	NPort 5110/5130/5150 Series NPort 5210/5230/5232 Series NPort 5410/5430/5450 Series NPort 5610/5630/5650 Series NPort 5610-8-DT/5650-8-DT Series NPort 5610-8-DTL/5650-8-DTL Series	NPort 5000 Series device servers make serial devices network-ready in an instant. The different form factors of the servers provide flexible options for users to connect legacy devices to an IP-based Ethernet LAN.
NPort 5000A	NPort 5110A/5130A/5150A Series NPort 5210A/ 5230A/5250A Series NPort 5150AI-M12/5250AI-M12/5450AI-M12 Series NPort P5150A Series	The NPort 5000A device servers make serial devices network-ready in an instant and give your PC software direct access to serial devices from anywhere on the network. The NPort 5000A device servers are ultra-lean, rugged, and user-friendly, making simple and reliable serial-to- Ethernet solutions possible.
NPort IA5000/IA5000A	NPort IA5150/IA5250 Series NPort IA5150A/IA5250A/IA5450A Series	NPort IA device servers are an ideal choice for establishing network access to RS-232/422/485 serial devices, including PLCs, sensors, meters, motors, drives, barcode readers, and operator displays. All models are housed in a compact, rugged, DIN-rail mountable housing, and come with redundant power inputs, cascading Ethernet ports, and industrial- grade certifications.

In this chapter, we explain how to install a Moxa NPort device server for the first time. There are four ways to access the Moxa NPort's configuration settings: Windows utility, web console, serial console, or Telnet console.

NPort products support the following configuration options:

- Windows Utilities: NPort Administrator; Device Search Utility and Windows Driver Manager
- Web Console
- Quick Setup Wizard\*
- Serial Console\*\*
- Telnet Console
- \* Does not support 5100/5200/IA5000 series
- \*\* Only available for the NPort Series that has RS-232 interface.

## **Installing Your NPort Device Server**

This section describes how to connect an NPort device server to your serial devices for the first time. We cover Wiring Requirements, Connecting the Power, Grounding the NPort Device Server, Connecting to the Network, Connecting to a Serial Device, and LED Indicators.

## **Wiring Requirements**



#### ATTENTION

#### Safety First!

Be sure to disconnect the power cord before installing and/or wiring your NPort Device Server.

#### Wiring Caution!

Calculate the maximum current allowed in each power wire and common wire. Observe all electrical codes dictating the maximum current allowed for each wire size. If the current goes above the allowed maximum, the wiring could overheat, causing serious damage to your equipment.

#### Temperature Caution!

Be cautious when handling the NPort device server. When plugged in, the NPort's internal components generate heat, and consequently, the casing may be too hot to the touch. When installed with other components, make sure that there is at least a 2-cm clearance on all sides of the NPort device server in order to allow proper heat dissipation.

You should observe:

• Use separate paths to route wiring for power and devices. If the power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.



#### NOTE

Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wires that share similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separately.
- Where necessary, we strongly advised that you label wires to all devices in the system.

## **Connecting the Power**

Connect the power line with the NPort's power input. If the power is properly supplied, the "Ready" LED will show a solid red color until the system is ready, at which time the "Ready" LED will change to a green color.

## **Grounding the NPort Device Server**

Note: This section only applies if your NPort's power input is on a terminal block.

Grounding and wire routing help limit the effects of noise caused by electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface before connecting the devices.



#### WARNING

NPorts with a power terminal block are intended to be mounted to a well-grounded mounting surface, such as a metal panel.

Type of Power Terminal Block	Shielded Ground (SG)	Applicable Products
	The Shielded Ground (sometimes called Protected Ground) contact is the left most contact of the 7-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.	NPort IA5000 Series
L L L L L L L L L L L L L L	The Shielded Ground (sometimes called Protected Ground) contact is the left most contact of the 8-contact power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.	NPort IA5000A Series
	The Shielded Ground (sometimes called Protected Ground) contact is the left most contact of the 3-pin power terminal block connector when viewed from the angle shown here. Connect the SG wire to an appropriate grounded metal surface.	NPort 5200/5400 Series NPort 5200A Series
⊕⊗⊗⊕⊕ ∨+ ∨- ⊜ sg	The Shielded Ground (sometimes called Protected Ground) contact is the second contact from the right of the 5-pin power terminal block connector on the rear panel of NPort 5600 VDC models. Connect the SG wire to the earth ground.	NPort 5600 Series

## **Connecting to the Network**

Connect one end of the Ethernet cable to the NPort's 10/100M Ethernet port and the other end of the cable to the Ethernet network. The NPort device server will show a valid connection to the Ethernet in the following ways:

- The Ethernet LED maintains a solid green color when connected to a 100 Mbps Ethernet network.
- The Ethernet LED maintains a solid orange color when connected to a 10 Mbps Ethernet network.
- The Ethernet LED will flash when Ethernet packets are being transmitted or received.



#### ATTENTION

NPort IA5000/IA5000A/5600-8-DT Series of NPorts has two Ethernet ports that can create an open chain of NPort IA5000/IA5000A/5600-8-DT device servers. Be careful not to connect the Ethernet ports of the two device servers at the ends of the chain.

In other words, NPort IA5000/IA5000A/5600-8-DT Series of NPorts do NOT support closed chains.

## **Connecting to a Serial Device**

Connect a serial data cable between the NPort and the serial device. Serial data cables must be purchased separately. They are not provided with the NPort.

## **LED Indicators**

#### NPort 5100/5100A/P5150A Series

LED Name	LED Color	LED Function	
		Steady on:	Power is on, and the NPort is booting up.
	Red	Blinking:	Shows an IP conflict, or the DHCP or BOOTP server did not
			respond properly.
Ready		Steady on:	Power is on, and the NPort is functioning normally.
	Green	Blinking:	The device server has been located by NPort Administrator's
		Dilliking.	Location function.
	Off	Power is off,	or a power error condition exists.
		Steady on:	The device is connected to a 10 Mbps Ethernet connection, but
	Orange		data is NOT being transmitted.
	Orange	Blinking:	The Ethernet port is connected, and data is being transmitted at
		Diniking.	10 Mbps.
Link		Steady on:	The device is connected to a 100 Mbps Ethernet connection, but
	Green	Steady on.	data is NOT being transmitted.
	Green	Blinking:	The Ethernet port is connected, and data is being transmitted at
			100 Mbps.
	Off	The Ethernet cable is disconnected or has a short.	
	Orange	The serial port is receiving data.	
Tx/Rx	Green	The serial po	rt is transmitting data.
	Off	Data is NOT being transmitted or received through the serial port.	

## NPort 5200/5200A/5400 Series

LED Name	LED Color	LED Function		
		Steady on:	Power is on, and the NPort is booting up.	
	Red	Plinking	Shows an IP conflict, or the DHCP or BOOTP server did not	
		Blinking:	respond properly.	
Ready		Steady on:	Power is on, and the NPort is functioning normally.	
	Green	Blinking:	The device server has been located by NPort Administrator's	
		Dinking.	Location function.	
	Off	Power is off,	or a power error condition exists.	
		Steady on:	The device is connected to a 10 Mbps Ethernet connection, but	
	Orange		data is NOT being transmitted.	
	orunge	Blinking:	The Ethernet port is connected, and data is being transmitted at	
Link			10 Mbps.	
(Ethernet)		Steady on:	The device is connected to a 100 Mbps Ethernet connection, but	
(Ethernet)	Green	Steady on.	data is NOT being transmitted.	
	Green	Blinking:	The Ethernet port is connected, and data is being transmitted at	
		billiking.	100 Mbps.	
	Off	The Ethernet cable is disconnected or has a short.		
P1, P2,	Orange	The serial port is receiving data.		
(P3, P4)	Green	The serial po	rt is transmitting data.	
(13,14)	Off	Data is NOT	Data is NOT being transmitted or received through the serial port.	

## NPort 5600 Series (Rackmount)

LED Name	LED Color	LED Function		
		Steady on:	Power is on and the NPort is booting up.	
	Red	Blinking:	Shows an IP conflict, or the DHCP or BOOTP server did not	
		Dilliking.	respond properly.	
Ready		Steady on:	Power is on, and the NPort is functioning normally	
	Green	Plinking	The device server has been located by NPort Administrator's	
		Blinking:	Location function.	
	Off	Power is off, or a power error condition exists.		
Tx/Rx,	Orange	The serial po	The serial port is receiving data.	
P1 to P16	Green	The serial po	The serial port is transmitting data.	
FILOFIO	Off	Data is NOT	being transmitted or received through the serial port.	
	Green	The Ethernet port is connected, but data is NOT being transmitted.		
LAN	Blinking	The Ethernet port is connected, and data is being transmitted.		
	Off	The Ethernet port is disconnected.		
PWR	Green	Power cable	is connected and provides electricity properly.	
	Off	Power cable is disconnected.		

## NPort 5600-8-DT/DTL Series

LED Name	LED Color	LED Function			
PWR	Red	Power is on.			
PWR	Off	Power is off.			
		Steady on:	The NPort is operational.		
Doody	Green	Plinking	The NPort is responding to NPort Administrator's Location		
Ready		Blinking:	function, or the NPort is being reset to factory defaults.		
	Off	Power is off,	or power error condition exists.		
	Red	Shows an IP conflict, or the DHCP or BOOTP server did not respond properly.			
Fault	Off	No fault condition detected.			
	Off	Blinking:	Network is connected, data is being transmitted.		
ETH 1, ETH2	Green	Steady on	Network is connected, no data is being transmitted.		
CIN 1, CIN2	Off	Blinking	Network is connected, data is being transmitted.		
In Use	Green	Serial port has been opened by server side software.			
(P1 to P8)	Off	Serial port is	not currently opened by host side software.		
	Green (Tx)	Serial device	is transmitting data.		
Tx/Rx	Orange(Rx)	Serial device	is receiving data.		
(P1 to P8)	Off	No data is flo	No data is flowing to or from the serial port.		

## NPort 5000AI-M12 Series

LED Name	LED Color	LED Function		
PWR	Green	Power is being supplied to the power input.		
		Steady on:	Power is on, and the NPort is booting up.	
	Red	Blinking:	Shows an IP conflict, or the DHCP or BOOTP server did not	
		Dinking.	respond properly.	
Ready		Steady on:	Power is on, and the NPort is functioning normally	
	Green	Blinking:	The device server has been located by the NPort Administrator's	
		Dinking.	Location function.	
	Off	Power is off,	or a power error condition exists.	
	Orange	Steady on:	The device is connected to a 10 Mbps Ethernet connection, but	
			data is NOT being transmitted.	
		Blinking:	The Ethernet port is connected, and data is being transmitted at	
		Dinking.	10 Mbps.	
10M, 100M	Green	Steady on:	The device is connected to a 100 Mbps Ethernet connection, but	
			data is NOT being transmitted.	
	Green	Blinking:	The Ethernet port is connected, and data is being transmitted at	
		Dilliking.	100 Mbps.	
	Off	The Ethernet cable is disconnected or has a short.		
	Orange	The serial po	rt is receiving data.	
P1, P2, P3, P4	Green	The serial po	rt is transmitting data.	
	Off	Data is NOT	being transmitted or received through the serial port.	

LED Name	LED Color	LED Function		
PWR1, PWR2	Red	Power is being supplied to power input PWR1, PWR2.		
		Steady on:	Power is on, and the NPort IA is booting up.	
			Shows an IP conflict, the DHCP or BOOTP server did not respond	
			properly, or a relay output was triggered. When the above two	
	Red	Blinking:	conditions occur at the same time, check the relay output first.	
		Dillikiliy.	If after resolving the relay output and the Ready LED is still	
Ready			blinking, then there is an IP conflict, or the DHCP or BOOTP	
			server did not respond properly.	
		Steady on:	Power is on and the NPort IA is functioning normally.	
	Green	Plinking	The device server has been located by the NPort Administrator's	
		Blinking:	Location function.	
	Off	Power is off, or a power error condition exists.		
	Orange	Steady on:	The device is connected to a 10 Mbps Ethernet connection, but	
			data is NOT being transmitted.	
	Orange	Blinking:	The Ethernet port is connected, and data is being transmitted at	
			10 Mbps.	
E1, E2		Steady on:	The device is connected to a 100 Mbps Ethernet connection, but	
	Green	Steady on.	data is NOT being transmitted.	
	Green	Blinking:	The Ethernet port is connected, and data is being transmitted at	
		Diniking.	100 Mbps.	
	Off	The Ethernet cable is disconnected or has a short.		
P1, P2,	Orange	The serial po	rt is receiving data.	
	Green	The serial port is transmitting data.		
(P3, P4)	Off	Data is NOT I	being transmitted or received through the serial port.	
FX*	Orango	Steady on:	The fiber port is connected, but data is NOT being transmitted.	
F <b>A</b> <sup>r</sup>	Orange	Blinking:	The fiber port is connected, and data is being transmitted.	

#### NPort IA5000/IA5000A Series

\*Only applies to NPort IA5000 fiber models.

## **Beeper Definition**

<b>Beeper Timing</b>	Frequency (Length/Intervals/Times)	Definition
Startup	100 ms / 100 ms / 2	When the NPort is ready to run
Locating	100 ms / 900 ms / when the user stops the function	When the NPort is located by a utility such as DSU

## **RS-485 Port's Adjustable Pull High/Low Resistor**

For some applications, you may need to use termination resistors to prevent the reflection of serial signals. When using termination resistors, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Refer to **Appendix B** for detailed instructions on how to set the pull high/low resistor values for different models.

## Windows Utility for the NPort

Moxa provides a few types of software with the NPort 5000 Series:

- The Device Search Utility (also known as DSU) includes broadcast search for all the NPort 5000s accessible over the network and basic configuration for a quick start.
- The NPort Administrator Suite is for COM mapping, a full set of configuration and monitoring tools. It serves the NPort 5000 Series only.
- The NPort Windows Driver Manger is for COM mapping of Real COM operation mode.

All utilities are available to download from Moxa's website: <u>https://www.moxa.com/en/support/product-support/software-and-documentation</u>, and select your product and look for the driver for your OS platform.

For more detailed information on how to use these useful utilities, refer to **Chapter 7**.

You may also use the web console, serial console, or Telnet to configure the device server. Refer to the section <u>Configuration by Web Console</u>, <u>Configuration by Serial Console</u>, and <u>Configuration by Telnet Console</u> for additional information on using these consoles.

## **Configuration by Web Console**

The Web Console is the most user-friendly way to configure NPort products. In this section, we cover a device server's general settings.

## **Opening Your Browser**

 Open your browser with the cookie functionality enabled. (To enable your browser for cookies, rightclick on your desktop's Internet Explorer icon, select **Properties**, click on the **Security** tab, and then select the three Enable options as shown in the figure below.)

Internet Options	? ×	Security Settings	? ×
General Security Content Connections Programs Advanced		Settings:	
Select a Web content zone to specify its security settings.		Cookies	•
		<ul> <li>Allow cookies that are stored on your computer</li> <li>Disable</li> </ul>	
		● Enable	
sites		O Prompt	
	_	Allow per-session cookies (not stored)	
Internet	- I	O Disable	
haven't placed in other zones		Enable	
		O Prompt	
CSecurity level for this zone	_	🚉 Downloads	
Move the slider to set the security level for this zone.		🗌 🦳 🔛 File download	
- Contraction -		O Disable	
- Safe browsing and still functional		Enable	
- Prompts before downloading potentially unsafe content     - Unsigned ActiveX controls will not be downloaded		A Foot download	Ľ.
Appropriate for most Internet sites			
		Reset custom settings	
- 1 -			
Custom Level Default Level		Reset to: Medium Reset	
OK Cancel Ap	ply	OK Cance	:

- 2. Type 192.168.127.254 in the **Address** input box (use the correct IP address if different from the default), and then press **Enter**.
- 3. For the overall NPort 5000 Series, you will be prompted to enter the username and password to access the NPort web console. Before configuring the NPort, you will need to unlock it first. Right-click the unit in the Configuration screen and select **Unlock** in the pop-up menu. The default username and password are **admin** and **moxa**, respectively. For the NPort 5100, 5200, and IA5000 Series, only the password is required to log in.

Web Interface for the NPort 5100, 5200, and IA5000 Series Only		
Input Password - Microsoft Internet Explorer		
File Edit View Favorites Tools Help		
📙 🖙 Back 🔹 🤿 🚽 🚳 🕼 🔞 Search 🛛 Favorites 🎲 History 🛛 🖏 🗸		
Address 🛃 http://192.168.127.254/		
Input password Password : Maxaa		
Submit		

Web Interface for	the Overall NPort 5000 Series	
ΜΟΧΛ°	Total Solution for Industrial Device Networking	www.moxa.com
	Username:	
	Password:	



#### ATTENTION

If you use other web browsers, remember to enable the functions to "allow cookies that are stored on your computer" or "allow per-session cookies." NPort device servers use cookies only for "password" transmissions.

The NPort home page will open. On this page, you can see a brief description of the Web Console's function groups.

NPort Web Console - Microsoft 1	Web Console - Microsoft Internet Explorer		
Ele Edit View Favorites Tool	; Help		
🌏 Back 🔹 🕥 🖌 💌 💋 🔮	🏠 🔎 Search 🛛 👷 Favorites 🛭 🍯	Neda 🧭 🔗 🧏	7
	ome.htm?Password=731a9e0a41ba3bb0		
,			
	www.mo	oxa.com 💪	
			-
Main Menu	Welcome to NPo	ort's web cons	ole !
Basic Settings			
Network Settings	Model Name	NPort IA-5250	
🖳 Serial Settings	MAC Address Serial No.	00:90:E8:52:50 525016	16
🗉 🦲 Operating Settings	Firmware Version	1.0	
🗀 Accessible IP Settings	System Uptime	0 days, 00h:00n	: 35<
🖲 🗋 Auto Warning Settings	NPort's web console provide		
Monitor	in ores web console provide	, the following function g	
Change Password	Basic Settings		
<ul> <li>Load Factory Default</li> <li>Save/Restart</li> </ul>	Server name, real time clock, time server IP address, and Web console, Telnet console Enable, Disable function.		
	Network Settings		
	IP address, netmask,	IP address, netmask, default gateway, static IP or dynamic IP, DNS, SNMP, IP location report.	
	Serial Settings		
		data bits, stop bits, flow	control, UART FIFO.
	Operating Settings		
		alive check, inactivity, de	limiters, force transmit timeout.
	Accessible IP Setting	e	
			to accept all IP's connection.
	Auto Warning Setting	15	
	Auto Warning Settings Auto warning E-Mail, SNMP Trap server IP address, Relay Output.		

#### Web Interface for the Overall NPort 5000 Series

#### **Welcome to NPort web console**

Overview		
Quick Setup	Model	NPort IA5450AI
Basic Settings	Name	NPIA5450AI_11625
Network Settings	Serial NO.	11625
- Serial Settings	Firmware	1.6 Build 19013022
- Operating Settings	IP	192.168.127.254
Accessible IP Settings	Mac Address	00:90:E8:4D:A9:6F
- Administration	Up Time	0 days 01h:18m:37s
- Backup/Restore	Serial Port 1	
System Log Settings		115200,None,8,1
- Auto Warning Settings	Serial Port 2	115200,None,8,1
System Log Event settings	Serial Port 3	115200,None,8,1
E-mail and SNMP Trap	Serial Port 4	115200,None,8,1
Event Type		
Upgrade Firmware		
- Monitor		
Line		
Async		
Async-Settings		



## Λ

#### ATTENTION

E-mail and SNMP Trap Event Type Upgrade Firmware - Monitor Line Async Async-Settings Relay Output System Log Change Password Load Factory Default Save/Restart Logout

If you can't remember the password, the ONLY way to configure the NPort is to load factory defaults by using the **Reset** button near the NPort's Ethernet port.

Remember to use NPort Administrator (for the NPort 5000 and the NPort IA5000 Series) to export the configuration file when you have finished the configuration. After using the **Reset** button to load factory defaults, your configuration can be easily reloaded into the NPort by using the NPort Administrator Import function. Refer to **Chapter 5** for details about using the Export and Import functions.

## Quick Setup (available for the NPort 5000A Series only)

**Quick Setup** streamlines configuration of your NPort into three basic and quick steps that cover the most used settings. While in Quick Setup, you may click the **Back** button at any time to return to the previous step or click the **Cancel** button to reverse all settings. For more detailed settings, refer to the **Basic Settings**, **Network Settings**, **Serial Settings**, and **Operating Settings** sections later in this chapter.

#### Step 1/3

In Step 1/3, you must assign a valid IP address to the NPort before it will work in your network environment. Your network system administrator should provide you with an IP address and related settings for your network. In addition, the server name field is a useful way to specify the location or application of different NPort units.

Server Settings		
Server name	NPIA5450AI_6671	
Network Settings	Static	
iP settings		
	192.168.127.135	
IP address	192.168.127.135 255.255.255.0	
IP address Netmask Gateway		
IP address Netmask		

#### Step 2/3

In Step 2/3, you must specify which operation mode you will use. If your operation mode is not **Real COM**, **TCP Server, TCP Client**, or **UDP mode**, click **Cancel**, return to the main menu, and choose **Operating Settings** to select the correct settings.

• Step 2/3			
Operation Mode Settings			
Real COM			
PC communicate with serial device through	n COM port.		
Remember to install Real COM/TTY of	lriver on PC. For detail inform	ation please refer to User's I	Manual.
© тср			
PC communicate with serial device through	n TCP port.		
Device is TCP client			
Destination IP address		Port 4001	
O UDP		the second s	
PC communicate with serial device through	UDP port.		
Destination IP address	Port 4001		
	Back	Next Cano	:el

## Step 3/3

In Step 3/3, change the **Serial Settings**.

• Step 3/3		
Serial Settings		
Baud rate	115200 🔻	
Data bits	8 🔻	
Stop bits	1 •	
Parity	None •	
nterface	RS-232 T	

#### **Finish Settings**

Review your settings on the **Finish Settings** page to confirm that they are correct and then click the **Save/Restart** button to restart the device with the new settings.

	been saved. Please check that your settings in the following and click Save/Restart for the r click Back to modify it.		
Basic Settings			
Server name	NPIA5450AI_6671		
Network Settings			
IP settings	Static		
IP	192.168.127.135		
Netmask	255.255.255.0		
Gateway			
Operation Mode Setting	js		
Mode	RealCOM		
Parameters			
Serial Settings			
Baudrate	115200		
Parameters	Data bits: 8, Stop bits: 1, Parity: None		
Interface	RS-232		

#### NOTE

If you change the IP address, you cannot use the **Home** button to return to the home page.

# Export/Import (Excluding the NPort 5100, 5200, and IA5000 Series)

**Configuration Import** Overview Configuration Import Quick Setup Select configuration file Choose File No file chosen Basic Settings Network Settings IP configuration Import all configurations including IP configurations. - Serial Settings - Operating Settings Submit Accessible IP Settings - Administration - Backup/Restore Pre-shared Key Configuration Import Configuration Export System Log Settings - Auto Warning Settings Upgrade Firmware - Monitor Change Password Load Factory Default Save/Restart Loaout **Configuration Export** Overview Configuration Export Quick Setup Basic Settings Network Settings Download - Serial Settings - Operating Settings Accessible IP Settings - Administration - Backup/Restore Pre-shared Key Configuration Import Configuration Export System Log Settings - Auto Warning Settings Upgrade Firmware - Monitor Change Password Load Factory Default Save/Restart Locout

Export/Import allows you to back up and recover your settings.

The exported configuration file can be encrypted for security with a user-specified export password (the default password is **moxa**), which you may assign in **Pre-shared Key**. Click **Download** to write all configuration data to a fixed file name: **<Servername>.txt**.

To import the configuration file, you will need to be sure that the pre-shared key stored in the system is the same as the configuration file (which is assigned when exporting the configuration file) to successfully import the configuration file.

If the firmware is not up to the version below, you may need to key in the password manually.

NPort 5100A Series Firmware v1.5 NPort 5200A Series Firmware v1.5 NPort 5150AI Series Firmware v1.4 NPort 5250AI Series Firmware v1.4 NPort 5450AI Series Firmware v1.4 NPort 5600 Series Firmware v3.9 NPort 5600 DT Series Firmware v2.6 NPort 5600 DTL Series Firmware v1.5 NPort IA5150A Series Firmware v1.4 NPort IA5450A Series Firmware v1.6



#### NOTE

The configuration encrypting function is not available in the NPort 5100, NPort 5200, and NPort IA5000 Series.

	• Pre-shared Key
Overview	
Quick Setup	Pre-shared Key
Basic Settings	Cipher key for encrypting the configuration file
Network Settings	
- Serial Settings	Submit
- Operating Settings	
Accessible IP Settings	
- Administration	
- Backup/Restore	
Pre-shared Key	
Configuration Import	
Configuration Export	

Refer to the table below for the firmware versions that support the encrypted configuration files in the Web Console.

Model Name	Firmware version supporting encrypted configuration files.
NPort 5100A Series	Firmware v1.3 and up
NPort 5200A Series	Firmware v1.3 and up
NPort 5x50AI-M12 Series	Firmware v1.2 and up
NPort IA5150A, NPort IA5250A	Firmware v1.3 and up
NPort IA5450A	Firmware v1.4 and up

## **Basic Settings**

Web Interface for the NPort 5100, 5200, and IA5000 Series Only				
🔄 Main Menu	Basic Setting			
	Dusie Setting			
Basic Settings	Server name	NP5210_816		
Network Settings		Time		
Serial Settings	Time zone	(GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London 🗸		
Operating Settings	Local time	2024 / 10 / 9 6 : 57 : 42		
Accessible IP Settings		Modify		
🗉 🦲 Auto Warning Settings	Time server			
🗉 🦲 Monitor		Settings		
🗀 Change Password	Web console	Enable      Disable		
🗀 Load Factory Default	Telnet console	○ Enable		
🛄 Save/Restart	Reset button protect	● No ○ Yes		
		Submit		

Server Settings		
Server name	NP5210A_8143	
Time Settings		
Time zone	(GMT)Greenwich Mean Time	e: Dublin, Edinburgh, Lisbon, London 🗸
Time	2000 / 1 / 2	2 22 30 Modify
Time server		
Console Settings		
HTTP console	Enable	O Disable
HTTPS console (support TLS v1.2)	Enable	O Disable
TLS v1.0/v1.1 for HTTPS console	O Enable	Disable
Reject an unrecognized host header	Enable	O Disable
Telnet console	O Enable	Disable
Serial console	Enable	O Disable
Moxa Service	Enable	O Disable
Sensitive Data Encryption	MD5/AES128 V	
Maximum Login Users For HTTP+HTTPS	6 (1~6)	
Auto Logout Setting (min)	5 (1~1440)	
Reset button protect	No	O Yes

-Basic Settings		
Server Settings		
Server name	NP5450AI-M12_9988	877665544
Time Settings		
Time zone	(GMT)Greenwich Mea	an Time: Dublin, Edinburgh, Lisbon, London 🗸
Time	2020 / 9 / 6 2	23   56   11 Modify
Time server		
Daylight Saving Time Settings		
	Month	Week Day Hour
Start Date		
End Date		
Offset	0 v hour(s)	
Console Settings		
HTTP console	O Enable	Disable
HTTPS console (support TLS v1.2)	Enable	Olisable
TLS v1.0/v1.1 for HTTPS console	O Enable	Disable
Telnet console	O Enable	Disable
Serial console	O Enable	Disable
Moxa Service	Enable	O Disable
Maximum Login Users For HTTP+HTTPS	6 (1~6)	
Auto Logout Setting (min)	1440 (1~1440)	)
Reset button protect	No	⊖ Yes
Beeper Settings		
Beep service	Enable	O Disable



#### NOTE

The NPort 5100/5100A does not support Time Settings.

Parameter	Setting	Factory Default	Description	Necessity
Server name	1 to 39 characters	NP[model name]_[Serial	This option is useful for specifying the location or application of	Optional
Time zone	User selectable time zone Not available in NPort	No.] GMT (Greenwich	different NPorts.	Required
	5100/5100A/5200/5200A Series User adjustable time	Mean Time)	Click the Medific button to ener	
Local time	(1900/1/1-2037/12/31) Not available in NPort 5100/5100A Series	GMT (Greenwich Mean Time)	Click the <b>Modify</b> button to open the change time settings window to input the correct local time.	Required
Time server	IP or Domain address (only available in 2/4/8/16 ports models) E.g., 192.168.1.1 or time.stdtime.gov.tw or time.nist.gov	None	NPorts use SNTP (RFC-1769) for auto time calibration. Input the correct <b>Time server</b> IP address or domain name. Once the NPort is configured with the correct Time server address, the NPort will request time information from the Time server every 10 minutes.	Optional
Daylight saving	Setting 1: "Start Date: Month, Week, Day, Hour" Setting 2: "End Date: Month, Week, Day, Hour" Setting 3: "Offset: hours"	None	The NPort can offset the system time to the values you have set in these settings. (This feature only applies to the NPort 5000AI-M12 Series.)	Optional
HTTP console	Enable or Disable	Enable	The options that are disabled by	
HTTPS console	Enable or Disable	Enable	default-http Console, Telnet	
TLS v1.0/v1.1 for HTTPS console	Enable or Disable	Disable	Console, and Serial Console—are for security reasons. In some cases, disable one or most of	
Telnet console	Enable or Disable	Disable	these console utilities as an extra	Required
Serial console	Enable or Disable	Enable	precaution to prevent	
Moxa Service	Enable or Disable	Enable	unauthorized users from accessing your NPort. Refer to <b>Chapter 3</b> "Cybersecurity Considerations" for detailed suggestions.	
Reject an unrecognized host header	Enable or Disable	Enable	To prevent a HTTP Host header attack, its default enabled.	Required
Sensitive Data Encryption	MD5/AES128, SHA256/AES256	MD5/AES128	The password may be transmitted in the Moxa service on the network. In the past, we used MD5 or AES128 to protect it. Starting from firmware version 2.0, it can be protected by SHA256 or AES256. To achieve this, upgrade the DSU to v2.4 and NPort Windows Driver Manager to v2.1.	Required
Maximum Login Users For HTTP+HTTPS	1 to 6	6	Set the maximum number of users allowed on web console	Required
Auto Logout Setting (min.)	1 to 1440 minutes	5	Set the logout time	Required

Parameter	Setting	Factory Default	Description	Necessity
Reset button protection	Yes or No	No	Select the <b>Yes</b> option to allow limited use of the Reset Button. In this case, the reset button can be used for only 60 seconds; 60 s. after booting up, the reset button will be disabled automatically.	Required
Beep Service	Enable or Disable	Enable	Beeper Service is to provide audio notification and warning according to the different situations. (This feature only applies to the NPort 5000AI-M12 Series.)	Optional
LCM read-only protection	Writeable/Read-only	Writeable	The NPort 5000 front panel, known as the LCM (Liquid Crystal Module), may be configured for read-only or writeable access. Read-only access allows settings to be viewed but not changed. Writeable access allows users in the Administration group to change the setting. This setting is only available for the model that has a font panel.	Optional



#### WARNING

If you disable both the http/https console and Telnet console, you can still use NPort Administrator to configure the NPort device servers either locally or remotely over the network. Refer to **Chapter 5** for details. If you disable all the console and services, there is no alternative way to access the NPort device servers neither locally nor remotely. The only way to gain control is to reset to factory default settings.

## **Network Settings**

Neb Interface for the	e NPort 5100, NPort 520	00, and NPort IA5000 Series Only		
MOXA				
	www.mox	a.com		
Alin Menu	Network Settings			
Basic Settings	IP address	192.168.127.254		
Network Settings Serial Settings	Netmask	255.255.255.0		
Operating Settings	Gateway			
Accessible IP Settings	IP configuration	Static		
Auto Warning Settings	DNS server 1			
Change Password	DNS server 2			
Load Factory Default Save/Restart	SNMP Setting			
Save/Restart	SNMP	• Enable C Disable		
	Community name	public		
	Contact			
	Location			
		IP Address report		
	Auto report to IP			
	Auto report to TCP port	4002		
	Auto report period	10 seconds		
		Submit		

Web Interface for the Overall NPort 5000 Series, excluding the NPort IA5000A Series

Network Settings		
address	192.168.127.254	
etmask	255.255.255.0	
ateway		
configuration	Static 🛟	
NS server 1		
NS server 2		
NS server 2 P Address Report uto report to IP		
P Address Report	4002	
P Address Report uto report to IP	4002 10 (0~99 secs)	
P Address Report uto report to IP uto report to UDP port		
P Address Report uto report to IP uto report to UDP port uto report period		

• Network Set	ungs	
Network Settings		
LAN1 IP address	192.168.127.254	
LAN1 Netmask	255.255.255.0	
LAN1 Gateway		
LAN1 IP configuration	Static \$	
Multi-LAN mode	Switch \$	
LAN2 IP address	192.168.126.254	
LAN2 Netmask	255.255.255.0	
LAN2 Gateway		
LAN2 IP configuration	Static \$	
DNS server 1		
DNS server 2		
IP Address Report		
Auto report to IP		
Auto report to IP (LAN2)		
Auto report to UDP port	4002	
Auto report period	10 (0~99 secs)	
LLDP Settings		
LLDP	Senable ○ Disable	
Message Transmit Interval	30 (5~32768 secs)	

You must assign a valid IP address to the NPort before it works in your network environment. Your network system administrator should provide you with an IP address and related settings for your network. The IP address must be unique within the network (otherwise, the NPort will not have a valid connection to the network). You can choose from four possible **IP configuration** modes—Static, DHCP, DHCP/BOOTP, and BOOTP—located under the web console screen's IP configuration drop-down box.

Method	Function Definition
Static	The user must define the IP address, Netmask, and Gateway.
DHCP	The DHCP Server assigns the IP address, Netmask, Gateway, DNS, and Time Server
DHCP/BOOTP	The DHCP Server assigns the IP address, Netmask, Gateway, DNS, and Time Server, or
DIICF/BOOTF	the BOOTP Server assigns the IP address (if the DHCP Server does not respond).
BOOTP	The BOOTP Server assigns the IP address.

Parameter	Setting	Factory Default	Description	Necessity
Tarameter	Setting	Fuctory Derudit	An IP address is a number assigned to a	inceessit)
IP Address	E.g., 192.168.1.1	192.168.127.254	network device (such as a computer) as a permanent address on the network. Computers use the IP address to identify and talk to each other over the network. Choose a proper IP address that is unique and valid in your network environment.	Required
Netmask	E.g., 255.255.255.0	255.255.255.0	A subnet mask represents all the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the NPort will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on the local network segment. If the address is on the same network segment as the NPort, a connection is established directly from the NPort. Otherwise, the connection is established through the default gateway.	Required
Gateway	E.g., 192.168.1.1	None	A gateway is a network gateway that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. The NPort needs to know the IP address of the default gateway computer to communicate with the hosts outside the local network environment. For correct gateway IP address information, consult with your network administrator.	Optional
IP Configuration	Static DHCP DHCP/BOOTP BOOTP	Static	N/A	Required
Multi-LAN mode (for the NPort IA5000A Series only)	Switch Redundant LAN Dual IP	Switch	Dual LAN can be used as a redundant connection or dual IP. The scenario for redundancy is the NPort will automatically switch to working connection in case the other one loses connectivity (because of failed network component in the NPort, port at the switch/router stop working, etc.). As for dual IP scenario, each port will have its own IP address, but both will have the same MAC address, as it is convenient to connect the NPort to different network.	Optional
DNS server 1/ DNS server 2	E.g., 192.168.1.1	None	In order to use the NPort's DNS feature, you need to configure the DNS server. Doing so allows the NPort to use a host's domain name to access the host. The NPort provides DNS server 1 and DNS server 2 configuration items to configure the IP address of the DNS server. DNS Server 2 is included for use when DNS server 1 is unavailable. The NPort plays the role of DNS client, in the sense that the NPort will actively query the DNS server for the IP address associated with a particular domain name.	Optional
LLDP Settings	Enable or Disable	Enable	Not available for the NPort 5600DT Rev 1.5 or earlier	Optional



#### WARNING

In Dynamic IP environments, the firmware will be retried three times every 30 seconds until network settings are assigned by the DHCP or BOOTP server. The Timeout for each try increases from 1 second, to 3 seconds, to 5 seconds.

If the DHCP/BOOTP Server is unavailable, the firmware will use the default IP address (192.168.127.254), Netmask, and Gateway for IP settings.

Web Interface for th	e Overall NPort 5000	Series
	:-SNMP Agent Se	ttings
Overview Quick Setup	Configuration	
Basic Settings	SNMP	Enable O Disable
Network Settings	Read community string	public
- Serial Settings	Contact name	
- Operating Settings	Location	
Accessible IP Settings		
- Administration	SNMP agent version	✓ v1 ✓ v2
- Account Management		
Notification Message	Submit	
User Account		
Password & Login Policy		
SNMP Agent		
- Backup/Restore		
System Log Settings		

#### **SNMP Settings**

Parameter	Setting	Factory Default	Description	Necessi ty
<i>Community Name</i>	1 to 31 characters (e.g., Moxa)	Public	A community name is a plain-text password mechanism that is used to weakly authenticate queries to agents of managed network devices.	Optional
Contact	1 to 31 characters (e.g., Support, 886- 89191230 #300)	None	The SNMP contact information usually includes an emergency contact name and telephone or pager number.	Optional
Location	1 to 39 characters (E.g., floor 1, office 2)	None	Specify the location string for SNMP agents, such as the NPort. This string is usually set to the street address where the NPort is physically located.	Optional
SNMP Agent Version V1, V2, V3	V1, V2, V3 (V3 is available on 4/8/16 ports model)	V1, V2 checked for 1/2-port models. V1, V2, V3 checked for 4/8/16-port models.	The NPort 5000 1- and 2-port model supports SNMP V1 and V2, where the 4/8/16-port model supports V1, V2 and V3. Select the version according to your environmental needs. Note that the 4/8/16- port model only supports standard MIB such as RFC1213/1317, which supports Set server name, contact, location, whereas the 1/2- port model only supports Get, but not Set.	Optional
of access: read example, Read access, wherea	-only and read/write. -only authentication r s Read/write authent	The name of the node allows you t ication mode allow	isswords, and authentication parameters for tw field will show which level of access it refers to o configure the authentication mode for read-or ws you to configure the authentication mode for configure the following:	o. For only
Read-only username	1 to 31 characters	None	Use this optional field to identify the username for the specified level of access.	Optional
Read-only authentication mode	MD5, SHA	Disable	Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication	Optional
Read-only password	1 to 31 characters		Use this field to set the password for read only of access.	Optional

Parameter	Setting	Factory Default	Description	Necessi ty
Read-only privacy mode	DEC, CBC	Disable	Use this field to enable or disable DES_CBC data encryption for the specified level of access.	Optional
Read-only privacy	1 to 31 characters	None	Use this field to define the encryption key for the specified level of access.	Optional
<i>Read/write username</i>	1 to 31 characters	None	Use this optional field to identify the username for the specified level of access.	Optional
<i>Read/write authentication mode</i>	MD5, SHA	Disable	Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication	Optional
Read/write only password	1 to 31 characters		Use this field to set the password for read/write access.	Optional
Read/write only privacy mode	DEC, CBC	Disable	Use this field to enable or disable DES_CBC data encryption for the specified level of access.	Optional
Read/write only privacy	1 to 31 characters	None	Use this field to define the encryption key for the specified level of access	Optional

#### **IP Address Report**

When NPort products are used in a dynamic IP environment, users must spend more time on IP management tasks. For example, if the NPort works as a server (TCP or UDP), then the host, which acts as a client, must know the IP address of the server. If the DHCP server assigns a new IP address to the NPort, the host must have some way of determining the NPort's new IP address.

NPort products help by reporting their IP address periodically to the IP location server, in case the dynamic IP has changed. The parameters shown below are used to configure the Auto IP report function. There are two ways to develop an "Auto IP report Server" to receive the NPort's Auto IP report.

- 1. Use Device Server Administrator's **IP Address Report** function.
- Auto IP report protocol, which can receive the Auto IP report automatically regularly, is also available to help you develop your own software. Refer to Appendix E for details about the Auto IP report protocol.

Parameter	Setting	Factory Default	Description	Necessity
Auto report to IP	E.g., 192.168.1.1 or URL	None	Reports generated by the Auto report function will be automatically sent to this IP address. In the multiple-LAN model version, two IPs can be set for the Auto report. The report will be sent to each IP when generated.	Optional
Auto report to UDP port	Auto report to IDP port E.g., 4001 4002		In the multiple-LAN model version, two IPs can be set for Auto report. Report will be sent to each IP when generated.	Optional
Auto report period	Time interval (in seconds)	10	NA	Optional

## **Serial Settings**

П

The **Serial Settings** page is where you set the serial communication parameters for each device port. Settings include baudrate, parity, and flow control. Each device port can be configured independently.

MOX	<u>∧ w</u>	ww.mo>	a.com								
Main Menu	Serial Sett	ings									
Basic Settings	Serial Settings										
Network Settings		Alias	Baud rate	Data bits	Stop bits	Parity	FIFO	Flow ctrl	Interface		
Serial Settings	Port 1		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 1	Port 2		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 2	Port 3		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 3	Port 4		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 4	Port 5		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 5	Port 6		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 6	Port 7		115200	8	1	None	Enable	RTS/CTS	RS-232		
Port 7	Port 8		115200	8	1	None	Enable	RTS/CTS	RS-232		

Web Interface for the	<b>Overall NPort 5000 Series</b>

Port	Alias	Baud rate	Data bits	Stop bits	Parity	FIFO	Flow ctrl	Interface
1		115200	8	1	None	Enable	RTS/CTS	RS-232
2		115200	8	1	None	Enable	RTS/CTS	RS-232
3		115200	8	1	None	Enable	RTS/CTS	RS-232
4		115200	8	1	None	Enable	RTS/CTS	RS-232

To change serial settings for a particular port, click on the **Port Number** under **Serial Settings**, located under **Main Menu** on the left side of the browser window.

Web Interface for the NPort 5100, 5200, and IA5000 Series Only						
MOXA	www.moxa	a.com				
🔄 Main Menu	Serial Settings					
Overview						
Basic Settings		Port 1				
📄 Network Settings	Port alias					
🖻 🔂 Serial Settings		Serial Parameters				
Port 1	Baud rate	115200 🗸				
Port 2	Data bits	8 🛩				
Port 4	Stop bits	1				
Dort 5	Parity	None 🗸				
Port 6	Flow control	RTS/CTS 🗸				
Port 7	FIFO	⊙ Enable ○ Disable				
Coperating Settings	Interface	RS-232 V				
Accessible IP Settings	Apply the above settings to all	serial ports				
🗉 🦲 Auto Warning Settings						
Monitor		Submit				

-Serial Settin					
Port 1					
Port alias					
Serial Settings					
Baud rate	115200 \$				
Data bits	8 \$				
Stop bits	1 🛊				
Parity	None 💠				
Flow control	RTS/CTS \$				
FIFO	<ul> <li>Enable</li> </ul>	Disable			
Interface	RS-232 \$				
Apply the above settings to	✓ P1	P2	P3	□ P4	
report are above settiligs to	All ports				



#### ATTENTION

It is critical that the device port's serial communication settings match the attached device. Refer to the user's manual for your serial device for the correct serial communication settings.

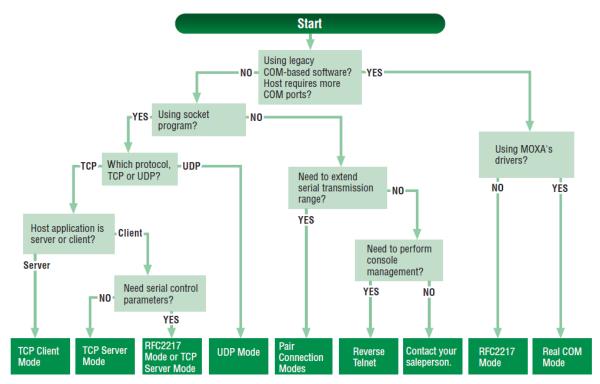
Parameter	Setting	Factory Default	Description	Necessity
Port Alias	1 to 15 characters (E.g., PLC-No.1)	None	Port Alias is specially designed to allow easy identification of the serial devices that are connected to the NPort's serial port.	Optional
Baud rate	Support standard baudrates (bps): 50/ 75/ 110/ 134/ 150/ 300/ 600/ 1200 1800/ 2400/ 4800/ 7200/ 9600/ 19200/ 38400/ 57600/ 115200/ 230.4k/ 460.8k/ 921.6k * The NPort 5110/5210/ 5230/5232I Series, and IA 5000 series are as low as 110 bps, and up to 230.4 kbps	115200 bps	The rate of data transmission to and from the attached serial device.	Required
Data bits	5, 6, 7, 8	8	When data bits is set to 5 bits, the stop bits setting will automatically change to 1.5 bits.	Required
Stop bits	1, 1.5, 2	1	The size of the stop character.	Required
Parity	None, Even, Odd, Space, Mark	None	Even and Odd parity provides rudimentary error-checking; Space and Mark parities are rarely used.	Required
Flow control	None, RTS/CTS, DTR/DSR, Xon/Xoff	RTS/CTS	The method used to suspend and resume data transmission to ensure that data is not lost. If you can use it, <b>RTS/CTS (hardware)</b> flow control is recommended.	Required
FIFO	Enable, Disable		Controls whether the device port's built-in 128-byte FIFO buffer is used. When enabled, the FIFO helps reduce data loss regardless of direction.	Required

Parameter	Setting	Factory Default	Description	Necessity
Interface*	RS-232 RS-422 2-wire RS-485 4-wire RS-485	RS-232	The serial interface that will be used. The options that are available depend on the specific model of the device server.	Required

\*Supported interfaces vary by model. Refer to the datasheet of your NPort device to see which serial interface it supports.

## **Operating Settings**

Operating Settings is where each device port's operation mode and associated parameters are configured. Use the chart below to select the operation mode that is most suitable for your application and refer to **Chapters 4 and 5** for a detailed explanation of different operating modes and parameters.



Click on **Operating Settings** under **Main Menu** to display the operating settings for the NPort's serial ports. To change operating settings for a particular port, click on the **Port Number** under **Operating Settings**, located under **Main Menu** on the left side of the browser window.

Web Interface for the NPort 5100, 5200, and IA5000 Series Only	

-			Operating	Settings			
Port	Operating mode	Packing length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit	
		0	0 (Disable)	0 (Disable)	Do Nothing	0	
L	Real COM Mode	TCP alive check time: 7 Max connection: 1					
		0	0 (Disable)	0 (Disable)	Do Nothing	0	
	Real COM Mode	TCP alive ch Max connect					

#### Web Interface for the Overall NPort 5000 Series

		- Operation	n Modes					
view	Port	Operating Mode	Packing Length	Delimiter 1		Delimiter 2	Delimiter Process	Force Transmit
< Setup		operating measure	o constant	0 (Disable)		0 (Disable)	Do Nothing	0
Settings			U		-	U (Disable)	Do Nothing	U
ork Settings	1	RealCOM	TCP alive check time:		7			
al Settings			Max connection:		1			
rt 1			0	0 (Disable)		0 (Disable)	Do Nothing	0
_	2	RealCOM	TCP alive check time:		7			
rt 2			Max connection:		1			
rt 3			0	0 (Disable)		0 (Disable)	Do Nothing	0
rt 4	3	RealCOM	TCP alive check time:		7			
erating Settings			Max connection:		1			
ssible IP Settings			0	0 (Disable)		0 (Disable)	Do Nothing	0
ninistration	4	RealCOM	TCP alive check time:		7			
kup/Restore			Max connection:		1			
em Log Settings								

For each mode, the default settings should work for most applications. Change these settings only if necessary for your application. The operation mode and related parameters can be configured through the web console. The same parameters can also be configured using NPort Administrator, the Telnet console, or serial console. Refer to **Chapters 4 and 5** for details.

Main Menu	Operating Settings						
Overview		Port=1					
Basic Settings     Network Settings	Operation mode	TCP Server Mode					
Serial Settings	TCP alive check time	7 (0 - 99 min)					
🛄 Port 1							
Port 2	Inactivity time	0 (0 - 65535 ms)					
Operating Settings Port 1	Max connection	1.					
Port 2	Ignore jammed IP	@ No C Yes					
Accessible IP Setting	Allow driver control	@ No C Yes					
auto Warning Setting	js	Data Packing					
🗉 🗋 Monitor	Packing length	0 (0 - 1024)					
Change Password Load Factory Default	Delimiter 1	(Hex) T Enable					
Save/Restart	Delimiter 2	(Hex) Enable					
	Delimiter process	Do Nothing 🔄 (Processed only when Packing length is 0)					
	Force transmit	0 (0 - 65535 ms)					
		TCP Server Mode					
	Local TCP port	4001					
	Command port	966					
	Apply the above settings	Apply the above settings to all serial ports (Local listen port will be enumerated automatically).					

-	odes				
Port 1					_
Operation mode	RealCOM	\$			
TCP alive check time	7 (0 - 99 min)				
Max connection	1 🖨				
Ignore jammed IP	No Yes				
Allow driver control	No Yes				
Data Packing Packing length	0 (0 - 1024)				
Delimiter 1	00 (Hex)  Enable				
Delimiter 2	00 (Hex) Enable				
Delimiter process	Do Nothing 🔶 (Proc	cessed only when pac	king length is 0)		
	0 (0 - 65535 ms)				
Force transmit		D P2	P3	P4	
Force transmit Apply the above settings to	✓ P1	0 - 2			

## Accessible IP Settings

Web Interface for t	he N	IPort 5100, 5200, a	nd IA5000 Ser	ies Only		
MOXA	l.	www.moxa	<i>com</i>			
Main Menu	ACC	essible IP Setting	S			
🗀 Basic Settings						
Network Settings		nable the accessible IP		"Enable" will a		nnect.)
Serial Settings     Operating Settings			IP Address		Netmask	
Port 1	1		ļ			
Port 2	2					
<ul> <li>Accessible IP Settings</li> <li>Auto Warning Setting</li> </ul>	0	Γ				
🗉 🗋 Monitor	4	E				
Change Password Load Factory Default	5	Г				
Save/Restart	6	<b>E</b>				
	7	Γ.				
	8	Γ.				
	9	Г				
	10	Г				

Web Interface	for the Overa	II NPort 5000 Series
---------------	---------------	----------------------

Verview				
Quick Setup	Act	ivate the accessible IP	list (Operation modes are NO	T allowed for the IPs NOT on the list)
asic Settings	Ap	ply additional restriction	ns (All device services are NO	T allowed for the IPs NOT on the list)
letwork Settings				
Serial Settings	No.	Activate the rule	IP Address	Netmask
Operating Settings	1			
accessible IP Settings	2			
Administration	3			
Backup/Restore	4	_		
Pre-shared Key				
Configuration Import	5			
Configuration Export	6			
ystem Log Settings	7			
Auto Warning Settings	8			
Ipgrade Firmware	9			
Monitor	10			
Change Password	11			
oad Factory Default	12			
ave/Restart	13			
ogout	14			
	15			
	16			

**Accessible IP Settings** allow you to add or block remote host IP addresses to prevent unauthorized access. Access to the NPort is controlled by an IP address. That is, if a host's IP address is in the accessible IP table, then the host will be allowed to access the NPort. Three setting types are described below:

#### Activate the Accessible IP list

Operation modes are NOT allowed for IPs NOT on the list. IPs that are not on the list will not be granted when communicating with the NPort via Operation mode.

#### Apply additional restrictions

All device services are NOT allowed for IPs NOT on the list. Services will not be granted for IPs that are not on the list. Note that all IPs will still have access if the IP list is empty, even though the function is enabled.

Tip: For exact IP identification, the netmask needs to be 255.255.255.255.

- Only one host with a specific IP address can access the NPort Enter "[IP address]/255.255.255.255" (e.g., "192.168.1.1/255.255.255.255").
- Hosts on a specific subnet can access the NPort Enter "[IP address]/255.255.255.0" (e.g., "192.168.1.0/255.255.255.0").

#### • Any host can access the NPort

Disable this function. Refer to the following table for more details about the configuration.

Allowable Hosts	Input format
Any host	Disable
192.168.1.120	192.168.1.120 / 255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0 / 255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0 / 255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0 / 255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128 / 255.255.255.128

## **Firmware Upgrading**

At times, Moxa needs to change the components within the NPort, which means the driver in the firmware needs to be updated. However, the firmware cannot always contain all the versions of the driver in one file; therefore, on some occasions, we need to separate the firmware for the older and newer versions of hardware. Before you decide to update the firmware to a newer or older version, make sure that the firmware is compatible with your NPort hardware version. In most cases, if a firmware does not specify for a particular hardware version, it is supposed to support all models in the series and for any hardware revision. If you are not sure, refer the product website to check for instructions or refer to the table below for specific cases, or otherwise, consult your region's technical support for confirmation.

Product Series	Models	Supporting Condition	Corresponding Firmware Version
NPort 5100	NPort 5110 Models	All revisions	v2.10
NPOIL SIDU	NPort 5130/5150 Models	All revisions	v3.9
NPort 5400	NPort 5410/5430 Models	Rev 2.x and prior	v2.9
NFUIL 3400	NPOIL 5410/5450 Models	Rev. 3.2 and later	v3.14
NPort 5600-DT	All	Supporting NPort 5600-DTL Series	v2.9
NPort IA5000A	NPort IA5150A/IA5250A models	All revisions	v1.5
NPOIL IAJUUUA	NPort IA5450A models	All revisions	v1.7
NPort IA5000	All	HW Rev 1.x	v1.7
NPOIL IASUUU	All	HW Rev 2.0 and after	v2.0
	NPort 5150AI-M12 models	All	v1.5
NPort 5000AI-M12	NPort 5250AI-M12 models	All	v1.5
	NPort 5250AI-M12 models	All	v1.5

Moxa will also roll out new firmware for feature/security enhancement, patches, etc. It may be necessary to visit the NPort product website frequently to check for the latest firmware. You may also register for Moxa's website and follow the product updates so that you will be notified automatically about any recent activity. Check for <u>G. How to Become a Registered User on the Moxa Website</u>.

Follow these steps to upgrade the firmware of an NPort through the web console:

1. Go to the web console and select the **Upgrade Firmware** function.

ΜΟΧΛ	* Total Solution f	or Industrial Device Net	working		www.moxa.com
Model	- NPort 5210A	= IP	- 192.168.127.254	MAC Address	- 00:90 E8:AD:44:D2
Name	- NP5210A_8143	Serial NO.	- 8143	Firmware	- 1.7 Build 24092017
Overview Quick Setup Basic Settings Network Settings - Serial Settings - Operating Settings	III Warning II Note: Upgrad Upgrade firmv	e firmware will discard your un- vare Choo	saved configuration changes and ro se File No file chosen	estart the system!	
Accessible IP Settings - Administration Backup/Restore System Log Settings Remote Log Server - Auto Warning Settings Upgrade Firmware - Monitor	Submi				

- 2. Click the **Choose File** and select the correct firmware file to load.
- 3. Click Submit and wait while the Upgrade Firmware action is processed.

#### NOTE

The NPort 5100, NPort 5200, and NPort IA5000 Series cannot upgrade firmware via the web console. To upgrade the firmware of the NPort 5100, 5200, and NPort IA5000 Series, refer to <u>Chapter 7. Windows</u> <u>Utilities for NPort 5000 Models</u>, and use either the Device Search Utility or NPort Administrator to complete the upgrade.

## **Account Management**

The Account Management setting provides administrators the authority to add/delete/modify a user account, grant access to the device users for specified function groups, and manage password and login policy to ensure device is used by a proper set of people.

## **Notification Message**

As an administrator, you may customize your **Login Message** and the **Login Authentication Failure Message** to notify users with information you would like to provide.

Notification Messa	age	
Notification Message		
Login Message	Welcome to NPort	
	Please contact administrators if you forget the password	16 characters/Maximum 240 characters
Login Authentication Failure Message		56 characters/Maximum 240 characters
Submit		

The message will appear on the login page at the time of a successful login or login failure. Examples are below.

ΜΟΧΛ	Total Solution for Industrial	Device Networking		www.moxa.com
		Usemame: Password:		
			LogIn	
	Welcome to NPort			

ΜΟΧΛ	Total Solution for Industrial Device Networking	www.moxa.com
	Usemarne: Password:	
	Login	
	Please contact administrators if you forget the password	

## **User Account**

In the NPort 5000 Series, the main function groups are highly correlated with the **User Level** set by the administrator(s). Administrators are allowed to add user accounts to the NPort 5000 device by clicking the **Add** button on the **User Account** page. You may also click on the current user to **Edit** or Delete the selected account.

User	Account	
User Accou	nt	
C	Add 💉 Edit 🏢 De	elete 📔 Save/Restart
Active	Account Name	User Level
$\checkmark$	admin	Read Write
$\checkmark$	guest	Read Only
Your change	s will take effect af	ter save and restart

The **Add Account (Edit Account)** page will show up for you to enter (modify) account information and assign password to this user. Also, the Administrator(s) may assign a proper **User Level** to this user to limit his/her privileges of using NPort 5000.

Add Account	
Active	
Account Name	
Password	
Confirm Password	
User Level	Read Write 🖨

## **Password and Login Policy**

A user with an administrator role is authorized to determine the password and login policy of the NPort 5000 device.

Account Password Policy	
Password minimum length	4 (4-16)
Password complexity strength check	Enable O Disable
At least one digit (0~9)	Enable   Disable
Mixed upper and lower case letters (A~Z, a~z)	Enable   Disable
At least one special character (~!@#\$%^&* ;:,.<>[]{))	Enable   Disable
Password lifetime	0 (0 - 180 day; 0 for Disable )
Account Login Failure Lockout	
Account login failure lockout	C Enable 💿 Disable
Retry failure threshold	5 (1 - 10 retry)
Lockout Time	5 (1 - 60 min)

#### Account Password Policy

Parameter	Setting	Default	Description
Password minimum length	4-16 characters	4	Define the minimum length of the login password
Password complexity strength check:	Enable/Disable	Disable	Enable password complexity strength check will enforce the password combination setting
• At least one digit (0-9)	Enable/Disable	Disable	The password must contain at least one number (0-9) when enabling this parameter
<ul> <li>Mixed upper- and lowercase letters (A to Z, a to z)</li> </ul>	Enable/Disable	Disable	The password must contain an upper and a lowercase letter when enabling this parameter
<ul> <li>At least one special character (~!@#\$%^&amp;*- _ ;:,.&lt;&gt;[]{}())</li> </ul>	Enable/Disable	Disable	The password must contain at least one special character when enabling this parameter
Password lifetime	0 to 180 days (0 for disable)	90 days	A password lifetime can be specified, and a system notification message will show up to remind users to change the password if the option is enabled.

#### **Account Login Failure Lockout**

Parameter	Setting	Default	Description
Account Login Failure Lockout	Enable/Disable	Disable	An account login failure lockout rule can be
Account Login Failure Lockout	LIIADIE/DISADIE	Disable	defined and enforced when enabled
Detro feilune three head	1 to 10 retry	5 if	Number of retries can be determined prior to
Retry failure threshold	1 to 10 retry	enabled	the lockout
La clus et time e	1 to 60	5 if	Lockout duration can be specified to determine
Lockout time	minute(s)	enabled	time until the next retry

## **Auto Warning Settings**

The NPort device server can automatically warn administrators of certain system, network, and configuration events. Depending on the event, different options for automatic notification are available. These options are configured in the Auto Warning Settings.

### Auto warning: Email and SNMP trap

The Email and SNMP trap parameters are used to configure how email and SNMP traps are sent when an automatic warning is issued by the NPort device server.

Web Interface for the	eb Interface for the NPort 5100, 5200, IA5000 Series								
MOXA	MOXA www.moxa.com								
🖾 Main Menu	Auto warning: Email an	id SNMP trap							
Overview	Mail server								
Basic Settings	Mail server								
Record Settings		J							
Port 1	My server requires authentication								
Port 2	User name								
🖻 🔄 Operating Settings	Password								
Port 1	From E-mail address	NPIA-5250_525016@moxe.com							
Port 2									
Accessible IP Settings	E-mail address 1								
E-mail and SNMP Trap	E-mail address 2								
Event Type	E-mail address 3								
Monitor     Change Password	E-mail address 4								
Load Factory Default	SNMP trap server								
Save/Restart	SNMP trap server IP or domain name								
		Submit							

atwork Settings     My server requires authentication       Serial Settings     User name       Deprating Settings     Password       administration     From E-mail address       Myster Log Settings     E-mail address       Auto Warning Settings     E-mail address 1       System Log Settings     E-mail address 2       System Log Settings     E-mail address 3       E-mail address 4     E-mail address 4       Event Type     SNMP Trap Server       Unit     SNMP Trap Server IP or domain name       Async     Trap version       Async-Settings     Trap computity	uick Setup asic Settings etwork Settings Serial Settings Operating Settings ccessible IP Settings Administration	Mail server My server requires authentication User name Password		
Aetwork Settings     Image: Settings       Serial Settings     User name       Operating Settings     User name       Administration     Password       Backup/Restore     From E-mail address       System Log Settings     E-mail address 1       Auto Warning Settings     E-mail address 3       System Log Event settings     E-mail address 4       Event Type     SNMP Trap Server       Jograde Firmware     SNMP trap Server IP or domain name       Async     Trap version	letwork Settings Serial Settings Operating Settings xccessible IP Settings Administration	My server requires authentication     User name     Password		
Serial Settings     User name       Operating Settings     User name       Accessible IP Settings     Password       Administration     From E-mail address       Administration     From E-mail address       Backup/Restore     E-mail address       System Log Settings     E-mail address 1       Auto Warning Settings     E-mail address 2       System Log Event settings     E-mail address 3       E-mail and SNMP Trap     E-mail address 4       Event Type     SNMP Trap Server       Une     SNMP Trap Server IP or domain name       Async     Trap version       Async-Settings     Trap community	Serial Settings Operating Settings Accessible IP Settings Administration	User name Password		
Operating Settings     User name       Accessible IP Settings     Password       Administration     From E-mail address       Backup/Restore     E-mail address       System Log Settings     E-mail address 1       Auto Warning Settings     E-mail address 2       System Log Event settings     E-mail address 3       E-mail address 3	Operating Settings Accessible IP Settings Administration	Password		
Administration     From E-mail address     NPort@moxa       Backup/Restore     E-mail address 1       System Log Settings     E-mail address 2       - Auto Warning Settings     E-mail address 2       System Log Event settings     E-mail address 3       E-mail and SNMP Trap     E-mail address 4       Upgrade Firmware     SNMP Trap Server       Line     SNMP trap server IP or domain name       Async     Trap version       Async-Settings     Trap computity	- Administration			
Backup/Restore System Log Settings E-mail address 1      Auto Warning Settings E-mail address 2  System Log Event settings E-mail address 3 E-mail address 3 E-mail address 3 E-mail address 4 Event Type Upgrade Firmware Monitor Line SNMP Trap Server SNMP Trap Server Async Async Async Strap computity Trap computity				
Backup/Restore System Log Settings E-mail address 1      Auto Warning Settings E-mail address 2  System Log Event settings E-mail address 3 E-mail address 3 E-mail address 3 E-mail address 4 Event Type Upgrade Firmware Monitor Line SNMP Trap Server SNMP Trap Server Async Async Async Strap computity Trap computity	- Backup/Restore	From E-mail address	NPort@mova	
System Log Settings     E-mail address 2       - Auto Warning Settings     E-mail address 2       System Log Event settings     E-mail address 3       E-mail and SNMP Trap     E-mail address 4       Event Type     Upgrade Firmware       - Monitor     SNMP Trap Server       Line     SNMP trap server IP or domain name       Async     Trap version       Async-Settings     Trap computity	Buonaprilootoro		H one hove	
System Log Event settings     E-mail address 3       E-mail and SNMP Trap     E-mail address 4       Event Type     E-mail address 4       Upgrade Firmware     SNMP Trap Server       - Monitor     SNMP Trap Server       Line     SNMP Trap Server       Async     Trap version       Async-Settings     Trap computity	System Log Settings	E-mail address 1		
E-mail and SNMP Trap     E-mail address 4       Event Type     Upgrade Firmware       - Monitor     SNMP Trap Server       Line     SNMP trap server IP or domain name       Async     Trap version       Async-Settings     Trap computity	- Auto Warning Settings	E-mail address 2		
Event Type Upgrade Firmware - Monitor Line Async Async Async Strap version Crap version Crap version Crap computity	System Log Event settings	E-mail address 3		
Upgrade Firmware SNMP Trap Server SNMP Trap Server Async Trap version Ov1 V2c	E-mail and SNMP Trap	E-mail address 4		
- Monitor Line SNMP trap server IP or domain name Async Async Trap version Trap computity Dublic Dublic	Event Type			
Monitor Line SNMP trap server IP or domain name Async Async Async-Settings Trap computity ublic	Upgrade Firmware			
Async Async Settings Trap computity with a setter of domain name	- Monitor	SNMP Trap Server		
Async-Settings	Line	SNMP trap server IP or domain name		
Async-Settings	Async	Trap version		
Relay Output Trap community public	Async-Settings		• •	
	Relay Output	Trap community	public	

#### **Mail Server**

Parameter	Setting	Factory Default	Description	Necessity
Mail server	IP or Domain Name	None	This optional field is for the IP address or domain name of your network mail server, if applicable. A mail server is required for the NPort to send email warnings about administrative events.	Optional
Username	1 to 15 characters	None	This optional field is used if your mail server requires it.	Optional
Password	1 to 15 characters	None	This optional field is used if your mail server requires it.	Optional
From Email address	1 to 63 characters	None	This optional field sets the "from" email address that will show up in an automatic warning email.	Optional
<i>Email address 1/2/3/4</i>	1 to 63 characters	None	These optional fields set the "destination" email address for automatic email warnings.	Optional

#### **SNMP Trap Server**

Parameter	Setting	Factory Default	Description	Necessity
SNMP trap server IP or domain name	IP address or Domain Name	None	Selecting the version based on your environmental needs. We strongly suggest to that you change the community name from the default <b>public</b> to another name; it is for security prevention reasons.	Optional



### ATTENTION

Consult your network administrator or ISP for the proper mail server settings. The **Auto warning** function may not work properly if it is not configured correctly. NPort SMTP AUTH supports LOGIN, PLAIN, CRAM-MD5 (RFC 2554).

### **Event Type**

Cold start	🗖 Mail	🗖 Trap	
Warm start	🗆 Mail	Trap	
Authentication failure	🗖 Mail	Trap	
IP address changed	🗖 Mail		
Password changed	🗆 Mail		
Power failure	🗆 Mail		Relay Output
Ethernet1 link down	🗆 Mail	🗖 Trap	🗖 Relay Output
Ethernet2 link down	🗖 Mail	Trap	E Relay Output
	[	OCD changed	
Port 1	🗖 Mail	🗖 Trap	Relay Output
Port 2	🗖 Mail	🗖 Trap	🗖 Relay Output
		OSR changed	
Port 1	🗆 Mail	🗖 Trap	E Relay Output
Port 2	🗖 Mail	Trap	Relay Output

#### Web Interface for the Overall NPort 5000 Series

ew	1			
etup	System Event			
ettings	Cold start	Mail	Trap	
Settings	Warm start	Mail	Trap	
ettings				
g Settings				
IP Settings	Config Event			
tion	Authentication failure	Mail	Trap	
lestore	IP changed	Mail		
g Settings	Password changed	Mail		
ning Settings	Power failure	<u> </u>		C Balay autout
og Event settings nd SNMP Trap		Mail		Relay output
	Ethernet1 link down	Mail	Trap	Relay output
mware	Ethernet2 link down	Mail	Trap	Relay output
iiiware				
	DCD Changed			
			~-	
ettings	Port 1	🗌 Mail	Trap	Relay output
tput	Port 2	🗆 Mail	Trap	Relay output
.og	Port 3	Mail	Trap	Relay output
ssword	Port 4	🗌 Mail	Trap	Relay output
ry Default				
rt	DSR Changed			
	Port 1	🗌 Mail	Trap	Relay output
	Port 2	🗌 Mail	Trap	Relay output
	Port 3	🗌 Mail	Trap	Relay output
	Port 4	Mail	Trap	Relay output

The Event Type parameters are used to configure which events will generate an automatic warning from the NPort device server, and how that warning will be issued. For each listed event, certain automatic warning options are available. If Mail is selected, an email will be sent. If Trap is selected, an SNMP trap will be sent. The **Relay Output** option is available for the NPort IA5000/IA5000A Series.

#### Cold start

Refers to starting the system from power off (contrast this with warm start). When performing a cold start, the NPort will automatically issue an auto warning message by email or send an SNMP trap after booting up.

#### Warm start

A warm start refers to restarting the computer without turning the power off. When performing a warm start, the NPort will automatically send an email, or send an SNMP trap after rebooting.

#### Authentication failure

An authentication failure event is triggered when the user inputs an incorrect password from the Console or Administrator. When an authentication failure occurs, the NPort will immediately send an email or SNMP trap.

#### IP address changed

An IP address changed event is triggered when the user has changed the NPort's IP address. When the IP address changes, the NPort will send an email with the new IP address before the NPort reboots. If the NPort cannot send an email message to the mail server within 15 seconds, the NPort will reboot anyway, and abort the email auto warning.

#### Password changed

A password changed event is triggered when the user has changed the NPort's password. When the password changes, the NPort will send an email with the password changed notice before the NPort reboots. If the NPort cannot send an email message to the mail server within 15 seconds, the NPort will reboot anyway, and abort the email auto warning.

#### Power failure (this event type only applies to NPort IA5000/IA5000A Series)

The NPort IA5000/IA5000A Series has two DC power inputs for redundancy. Different approaches are used to warn engineers automatically, including by email and by relay output. Users can connect to **Monitor > Relay Output** from the web console to check which event caused the warning. The relay output will be canceled after the power recovers, or by selecting "acknowledge event" using the web console or Telnet. When the Relay Output is sending a warning, the Ready LED will flash red until the warning event ceases.

MOX/	www.moxa.com		
Main Menu 🗀 Overview	Monitor Relay Output		
Basic Settings		Relay Output Status	
Network Settings	Power failure		Acknowledge Event
🧾 Serial Settings	Ethernet1 link down		Acknowledge Event
Operating Settings Accessible IP Settings	Ethernet2 link down		Acknowledge Event
Auto Warning Settings	DCD changed (Port 1)		Acknowledge Event
Monitor	DCD changed (Port 2)		Acknowledge Event
Line	DSR changed (Port 1)		Acknowledge Event
Async-Setting	DSR changed (Port 2)		Acknowledge Event

#### Web Interface for the NPort IA5000A Series

Verview			
Quick Setup	Dout Status		
Basic Settings	Power failure		Acknowledge Event
Network Settings	Ethernet1 link down	j.	Acknowledge Event
- Serial Settings	Ethernet2 link down	-	Acknowledge Event
- Operating Settings	DCD changed (Port 1)		Acknowledge Event
Accessible IP Settings			
- Administration	DSR changed (Port 1)	-	Acknowledge Event
- Account Management	DCD changed (Port 2)	1 K	Acknowledge Event
SNMP Agent	DSR changed (Port 2)	-	Acknowledge Event
- Backup/Restore	DCD changed (Port 3)		Acknowledge Event
System Log Settings			
- Auto Warning Settings	DSR changed (Port 3)	-	Acknowledge Event
System Log Event settings	DCD changed (Port 4)	-	Acknowledge Event
E-mail and SNMP Trap	DSR changed (Port 4)	-	Acknowledge Event
Event Type			
Upgrade Firmware			
- Monitor			
Line			
Async			
Async-Settings			
Relay Output			
System Log			
Change Password			

#### Ethernet link down

The NPort device server provides system maintainers with real-time alarm messages for Ethernet link down. Even when control engineers are out of the control room for an extended period, they can still be informed of the status of devices almost instantaneously when exceptions occur. The NPort device server supports different methods for warning engineers automatically, such as by email, SNMP trap, and relay output\*.

#### DCD changed

A DCD (Data Carrier Detect) signal change shows that the modem connection status has changed. For example, a DCD change to high shows that the local modem and remote modem are connected. A DCD signal change to low shows that the connection line is down. When the DCD changes, the NPort will immediately send an email, send an SNMP trap, or trigger the relay output\*.

#### DSR changed

A DSR (Data Set Ready) signal change indicates that the data communication equipment's power is off. For example, a DSR change to high indicates that the DCE is powered ON. A DSR signal changes to low indicates that the DCE is powered off. When the DSR changes, the NPort will immediately send an email, send an SNMP trap, or trigger the relay output\*.

\*Relay output is only supported by the NPort IA5000/IA5000A Series.



### NOTE

**Relay Output** is only available for the NPort IA5000/IA5000A Series. Users can connect to **Monitor** > **Relay Output** from the web console to check which event is causing the warning. The relay output will be canceled if the abnormal state is restored, or if **Acknowledge Event** is selected from the web or Telnet console. When the Relay Output is issuing a warning, the Ready LED will flash red until the warning event ceases.

Parameter	Setting	Factory Default	Description	Necessity
Mail	Enable, Disable	Disable	This feature helps the administrator manage how the NPort sends email to pre-defined email boxes when the enabled events (Cold start, Warm start, Authentication failure, etc.) occur. To configure this feature, click the <b>Event Type Mail</b> checkbox.	Optional
Trap	Enable, Disable	Disable	This feature helps the administrator manage how the NPort IA5000A sends an SNMP Trap to a pre-defined SNMP Trap server when the enabled events (Cold start, Warm start, Authentication failure, etc.) occur. To configure this feature, click the <b>Event Type</b> <b>Trap</b> checkbox.	Optional



### ATTENTION

DCD and DSR signal changes only apply for the RS-232 interface.

### Monitor

#### **Monitor Line**

Click **Line** under **Monitor** to show the operation mode and status of each connection (IPx), for each of the four serial ports.

ΜΟΧΛ		www.mo	xa.com							
Main Menu	Monito	or Line								
Basic Settings		Line								
Network Settings	Port	OP Mode	IP1	IP2	IP3	IP4				
Serial Settings	1	Real COM Mode	Listen							
Operating Settings	2	Real COM Mode	Listen							
Accessible IP Settings	3	Real COM Mode	Listen							
Auto Warning Settings	4	Real COM Mode	Listen							

Web Interface for the Overall NPort 5000 Series
---

		• Monitor	Line			
Overview	Dent	On continue Manda	Connections			
Quick Setup	Port	Operation Mode				
Basic Settings	1	RealCOM	[Listen]	[]]		[]]
Network Settings			[ ] [Listen]			
- Serial Settings	2	RealCOM	[ ]			
Port 1			[Listen]	[]		[]
Port 2	3	RealCOM	[]	[]]		[]
Port 3			[Listen]	i i	i i	i i
Port 4	4	RealCOM	[ ]	[ ]	[ ]	[]]
- Operating Settings						
Port 1						
Port 2						
Port 3						
Port 4						
Accessible IP Settings						
- Administration						
- Backup/Restore						
System Log Settings						
- Auto Warning Settings						
System Log Event settings						
E-mail and SNMP Trap						
Event Type						
Upgrade Firmware						
- Monitor						
Line						
Async						

## **Monitor Async**

Click **Async** under **Monitor** to show the status of each of the four serial ports.

MOXA		www.m	ioxa.co	m				
Main Menu	Monito	or Async						
Overview Basic Settings				Async	2			
Network Settings	Port	TxCnt	RxCnt	TxTotalCnt	RxTotalCnt	DSR	CTS	DCD
Serial Settings	1	0	0	0	0	OFF	OFF	OFF
	2	0	0	0	0	OFF	OFF	OFF
Operating Settings								
<ul> <li>Operating Settings</li> <li>Accessible IP Settings</li> </ul>	3	0	0	0	0	OFF	OFF	OFF

		:•Mon	itor Asy	nc						
Main Menu	l la c					1				
Overview	Port	TxCnt	RxCnt	TxTotalCnt	RxTotalCnt	DSR	DTR	RTS	CTS	DCD
Quick Setup	1	0	0	0	0					•
Export/Import	2	0	0	0	0		۰	۲	۹	•
Basic Settings										
Network Settings										
- Serial Settings										
- Operating Settings										
Accessible IP Settings										
- Auto Warning Settings										
Upgrade Firmware										
- Monitor										
Line										
Asynd										

### **Monitor Async-Settings**

Click **Async Setting** under **Monitor** to show the run-time settings for each of the four serial ports.

	www.mo	xa.com								
Monito	r Async-Setting	s								
	Async-Settings									
Port	Baud rate	Data bits	Stop bits	Parity	FIFO	RTS/CTS	XON/XOFF	DTR/DSR		
1	115200	8	1	None	Enable	OFF	OFF	OFF		
2	115200	8	1	None	Enable	OFF	OFF	OFF		
3	115200	8	1	None	Enable	OFF	OFF	OFF		
4	115200	8	1	None	Enable	OFF	OFF	OFF		
	Port 1 2	Baud rate           1         115200           2         115200           3         115200	Baud rate         Data bits           1         115200         8           2         115200         8           3         115200         8	Async           Port         Baud rate         Data bits         Stop bits           1         115200         8         1           2         115200         8         1           3         115200         8         1	Monitor Async-Settings           Async-Settings           Port         Baud rate         Data bits         Stop bits         Parity           1         115200         8         1         None           2         115200         8         1         None           3         115200         8         1         None	Monitor Async-Settings           Port         Baud rate         Data bits         Stop bits         Parity         FIFO           1         115200         8         1         None         Enable           2         115200         8         1         None         Enable           3         115200         8         1         None         Enable	Monitor Async-Settings           Port         Baud rate         Data bits         Stop bits         Parity         FIFO         RTS/CTS           1         115200         8         1         None         Enable         OFF           2         115200         8         1         None         Enable         OFF           3         115200         8         1         None         Enable         OFF	Monitor Async-Settings           Port         Baud rate         Data bits         Stop bits         Parity         FIFO         RTS/CTS         XON/XOFF           1         115200         8         1         None         Enable         OFF         OFF           2         115200         8         1         None         Enable         OFF         OFF           3         115200         8         1         None         Enable         OFF         OFF		

#### Web Interface for the Overall NPort 5000 Series

		• Mo	nitor A	sync-	Sett	ings				
Overview		David	Baud Data Bits	Stop Bits			Flow Control			
Quick Setup	Port				Parity		1	-	FIFO	Interface
Basic Settings		Rate				RTS/CTS	XON/XOFF	DTR/DSR		
Network Settings	1	115200	8	1	None	OFF	OFF	OFF	Enable	RS-232
- Serial Settings	2	115200	8	1	None	ON	OFF	OFF	Enable	RS-232
Port 1	3	115200	8	1	None	ON	OFF	OFF	Enable	RS-232
Port 2	4	115200	8	1	None	ON	OFF	OFF	Enable	RS-232
Port 3										
Port 4										
<ul> <li>Operating Settings</li> </ul>										
Port 1										
Port 2										
Port 3										
Port 4										
Accessible IP Settings										
- Administration										
- Backup/Restore										
System Log Settings										
- Auto Warning Settings										
System Log Event settings										
E-mail and SNMP Trap										
Event Type										
Upgrade Firmware										
- Monitor										
Line										
Async										
Async-Settings										
Relay Output										

# **System Log Settings**

System Log Settings							
Event Group	Local Log	Summary					
System		System Cold Start, System Warm Start					
Network		DHCP/BOOTP Get IP/Renew, NTP, Mail Fail, NTP Connect Fail, IP Conflict, Network Link Up, Network Link Down					
Config		Login Fail, IP Changed, Password Changed, Config Changed, Firmware Upgrade, Config Import, Config Export					
OpMode		Connect, Disconnect					



#### NOTE

The NPort 5100, NPort 5200, and NPort IA5000 Series don't support this function.

System Log Settings allow NPort users to customize network events that are logged by the NPort 5000. Events are grouped into four categories, known as event groups, and the user selects which groups to log as Local Log (on the NPort 5000). The actual system events that would be logged for each system group are listed under the column "Summary". For example, if **System** was enabled, then System Cold Start events and System Warm Start events would be logged.

Local Log	Keep the log in the flash of NPort 5000 up to 512 items.
LUCALLUY	Reep the log in the hash of NPOIL 5000 up to 512 items.

#### System

•,•••	
System Cold Start	NPort 5000 cold start.
System Warm Start	NPort 5000 warm start.

#### Network

DHCP/BOOTP/PPPoE Get IP/Renew	IP of the NPort 5000 is refreshed.
NTP	Time synchronization successful.
NTP Connect Fail	The NPort 5000 failed to connect to the NTP Server.
Mail Fail	Failed to deliver the email.
IP Conflict	There is an IP conflict on the local network.
Network Link Down	LAN 1 Link is down.

#### Config

Login Fail	
IP Changed	Static IP address was changed.
Password Changed	Administrator Password was changed.
Config Changed	The NPort 5000's configuration was changed.
Firmware Upgrade	Firmware was upgraded.
SSL Certificate Import	SSL Certificate was imported.
Config Import	Config was imported.
Config Export	Config was exported.

#### OpMode

Connect	Op Mode is in use
Disconnect	Op Mode switched from in use to disconnect.
Authentication Fail	The Authentication failed in terminal; reverse terminal; or dial in/out operation modes
Restart	Serial port restarted.

### **Change Password**

Set a password to restrict access to the NPort's configuration parameters. (The default password for NPort is **moxa**.) If a user does not enter the correct password when accessing the NPort through one of the consoles (e.g., web console), access to the NPort configuration settings will be denied.

Web Interface for the NPort 5100, 5200, IA5000 Series Only										
MOXA www.moxa.com										
🖻 Main Menu	Change password									
Overview										
Basic Settings	Old password :									
🗀 Network Settings	New password :									
🖲 🧰 Serial Settings	Patiene paceword i									
🖲 🗀 Operating Settings	Retype password :									
Accessible IP Settings	[Submit]									
🖻 🔁 Auto Warning Settings										
Auto Warning Settings										

	-Change Pas	sword
Overview		
Quick Setup	Password	
Basic Settings	Old password	
Network Settings	New password	
- Serial Settings		
Port 1	Retype password	
Port 2		
Port 3	Submit	
Port 4		
- Operating Settings		
Port 1		
Port 2		
Port 3		
Port 4		
Accessible IP Settings		
- Administration		
- Backup/Restore		
System Log Settings		
- Auto Warning Settings		
System Log Event settings		
E-mail and SNMP Trap		
Event Type		
Jpgrade Firmware		
Monitor		
Line		
Async		
Async-Settings		
Relay Output		
System Log		
Change Password		
Load Factory Default		

## 

### ATTENTION

If you forget the NPort's password, the ONLY way to configure the NPort is by using the hardware reset button to load the factory defaults. Before you set a password for the first time, it is a good idea to export the NPort's complete configuration to a file. Your configuration can then be easily restored if necessary.

## Load Factory Default

Web Interface for the NPort 5100, 5200, and IA5000 Series Only
www.moxa.com
Load Factory Default
This function will reset all MOXA NPort Server settings to their factory default values. Be aware that previous settings will be lost.
Submit
Web Interface for the Overall NPort 5000 Series
*Load Factory Default
This function will reset all MOXA NPort Server settings to their factory default values. Be aware that previous settings will be lost.
Submit
Be aware that previous settings will be lost.

This function will reset all the NPort's settings to the factory default values. Be aware that previous settings will be lost.

# **Configuration by Telnet Console**

Update your NPort's IP address by using Telnet to connect to your NPort IA5000A over the network. (Figures in this section were generated using the NPort IA5450AI).

- 1. From the Windows desktop, click on Start and then select Run.
- 2. Type **telnet 192.168.127.254** (use the correct IP address if different from the default) in the **Open** text input box, and then click **OK**.

Run	? 🗙
-	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	telnet 192.168.127.254
	OK Cancel Browse

3. When the Telnet window opens, you will be prompted to input the Console password (the default username is **admin** and password is **moxa**; for the NPort 5100/5200/IA5000, it only requires the default password **moxa**); input the password and then press **Enter**.



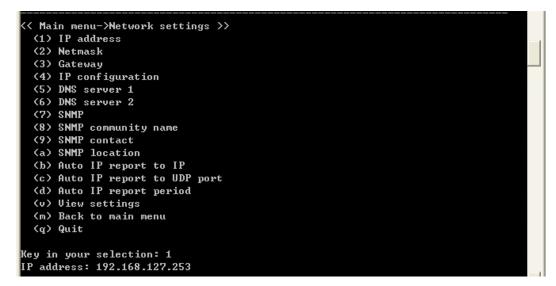
4. Type **2** to select Network settings, and then press **Enter**.

	: 00:90:E8:63:50:FD
Serial No.	: 7162 1 : 1.5 Build 19013022
	: 0 days, 01h:59m:07s
<pre>&lt;&lt; Main menu &gt;&gt;</pre>	
(1) Basic sett	lings
(2) Network se	ettings
(3) Serial set	ttings
<pre>(4) Operating</pre>	settings
(5) Accessible	e IP settings
(6) Account Ma	anagement
(7) Auto warni	ing settings
(8) Monitor	
(9) Ping	
(a) Change pas	sword
(b) Load facto	bry default
(v) View setti	ings
(s) Save/Resta	art
(q) Quit	

5. Type 1 to select IP address and then press Enter.



6. Use the **Backspace** key to erase the current IP address, type in the new IP address, and then press **Enter**.



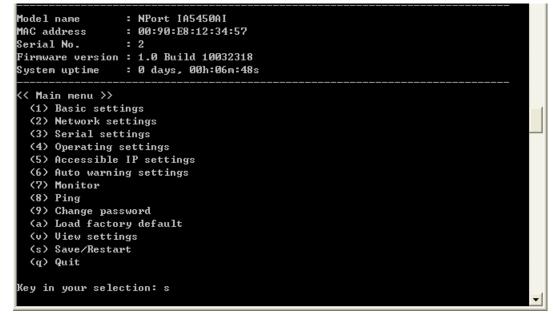
7. Press any key to continue...

```
<< Main menu->Network settings >>
 (1) IP address
 (2) Netmask
 (3) Gateway
 (4) IP configuration
 (5) DNS server 1
  (6) DNS server 2
 (7) SNMP
 (8) SNMP community name
  (9) SNMP contact
  (a) SNMP location
 (b) Auto IP report to IP
  (c) Auto IP report to UDP port
  (d) Auto IP report period
  (v) View settings
 (m) Back to main menu
 (q) Quit
Key in your selection: 1
IP address: 192.168.127.253
Set IP address success
Press any key to continue..._
```

8. Type **m** and then press **Enter** to return to the main menu.

```
<< Main menu->Network settings >>
  (1) IP address
  (2) Netmask
  (3) Gateway
  (4) IP configuration
  (5) DNS server 1
  (6) DNS server 2
  (7) SNMP
  (8) SNMP community name
  (9) SNMP contact
  (a) SNMP location
 (b) Auto IP report to IP(c) Auto IP report to UDP port
  (d) Auto IP report period
  <u>View settings
  (m) Back to main menu
  (q) Quit
Key in your selection: m
```

9. Type **s** and then press **Enter** to **Save/Restart** the system.



10. Type **y** and then press **Enter** to save the new IP address and restart the NPort.



# **Configuration by Serial Console**

## Serial Console (19200, n, 8, 1)

You may use the RS-232 console port to configure your NPort's IP address. We suggest using PComm Terminal Emulator, which is available free as part of the PComm Lite program suite, to carry out the installation procedure, although other similar utilities may also be used.

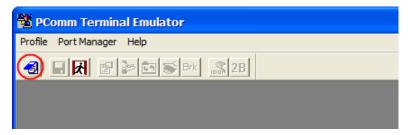


### ATTENTION

The serial console port is an RS-232 port.

Before you configure the NPort device server over the serial console, turn off the power and connect the serial cable from the NPort to your computer's serial port.

- 1. Connect the NPort's serial port 1 directly to your computer's male RS-232 serial port. From the Windows desktop click **Start > Programs > PComm Lite > Terminal Emulator**.
- 2. When the **PComm Terminal Emulator** window opens, first click on the **Port Manager** menu item and select **Open**, or simply click on the **Open** icon.

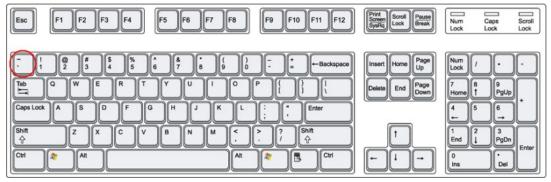


3. The **Property** window opens automatically. From the **Communication Parameter** page, select the appropriate COM port for the connection, COM1 in this example, and 19200 for Baud Rate, 8 for Data Bits, None for Parity, and 1 for Stop Bits.

Property	
Communication Parameter	Terminal   File Transfer   Capturing
COM Options Ports : Baud Rate : Data Bits : Parity :	COM1
Stop Bits :	
Flow Control	Output State DTR I ON I OFF RTS I ON I OFF
	OK Cancel

4. From the **Property** window's **Terminal** page, select ANSI or VT100 for **Terminal Type** and then click **OK**.

- 5. If you select **Dumb Terminal** as the terminal type, some of the console functions—especially the **Monitor** function—may not work properly.
- 6. Press the " ` " key continuously and then power on the NPort.



- 7. The NPort will automatically switch from data mode to console mode as it receives a continuous string of "`` " characters.
- 8. The default username is **admin**, and the password is **moxa**.

2 PComm Terminal Emulator - COM1,19200,None,8,1,Dumb Terminal		-	Х
Profile Edit Port Manager Window Help			 
COM1, 19200, None, 8, 1, Dumb Terminal			×
Model name : NFort 5250A			^
DTR Flease keyin your username:			
Flease keyin your password:			
			~
State:OPEN CTS DSk TT DCD Ready TX	:122	RX:108	11

9. Start configuring the IP address under **Network Settings**. Refer to step 4 in the Telnet Console section for the rest of the IP settings.

😼 PComm Terminal Emulator - COM1,19200,None,8,1,Dumb Terminal	<u>20</u>		×
Profile Edit Port Manager Window Help			
S COM1, 19200, None, 8, 1, Dumb Terminal			×
Model name : NFort 5250A MAC address : 00:90:E8:63:50:FD Serial No. : 7162 Firmware version : 1.5 Build 19013022 System uptime : 0 days, 00h:00m:54s			^
<pre>&lt;&lt; Main menu &gt;&gt; (1) Basic settings (2) Network settings (3) Serial settings (4) Operating settings (5) Accessible IF settings (6) Account Management (7) Auto warning settings (8) Monitor (9) Fing (a) Change password (b) Load factory default (v) View settings (s) Save/Restart (q) Quit </pre>			-
Key in your selection:		_	~
State:OPEN CTS DSR RI DCD Ready TX:137	RX:89	95	111

# **Testing Your NPort**

After completing installation and configuration, you can do a simple test to ensure that your NPort will communicate successfully. Click on the appropriate link below to view a technical note that explains how to test your NPort one of four common operation modes: Real COM, TCP client, TCP server, and UDP.

- <u>Real COM Mode for NPort</u>
- <u>TCP Client Mode for NPort</u>
- <u>TCP Server Mode for NPort</u>
- UDP Mode for NPort

With cyberattacks growing in number and sophistication, network device vendors are adding functions geared towards protecting sensitive business and personal information. Moxa has dedicated itself in this area by developing measure to make sure all the products can and will meet the security standard, so customers will use Moxa's product without too much to worry about. There are certain details that Moxa cannot do alone; customers and Moxa need to work together to build up a much-secured environment to defend against all kinds of cyberthreats. This chapter introduces the essential steps to enhance the cybersecurity of Moxa's products. Customers may need to refer to other sections in the user manual for exact settings or commands. The following topics are covered in this chapter:

# **Updating Firmware**

When a customer buys a product from Moxa or reseller, Moxa may have already pushed out a newer version of firmware and that is likely to have enhanced the security features included. We suggest you always update to the latest firmware. Check with Moxa's support website for further details.

# **Turn Off Unused Service and Ports**

Imagine living in a house that has many entrances. If all the doors and windows are left unlocked or even open, it sends a message of welcoming to intruders out there. It is always recommended to turn off services and ports that are not in use to reduce the chances of being attacked.

### **Turn Off Moxa Service After Installation**

Moxa Service is extremely helpful for first-time installation as it helps the device to be discovered in a local area network (LAN). Once the installation is completed, this service should be turned off for safety reasons; however, once it is turned off, a utility such as Moxa's DSU (Device Search Utility) is no longer seeking for the device, and only by the IP and login with username and password will have the access to the product.

## **Turn On Services That Are Necessary**

There are services that were designed some while ago, but then cybersecurity wasn't much of an issue, therefore the design's considerations didn't quite cover cybersecurity. Below is a list of services that are recommended to turn on only when necessary:

HTTP/HTTPS: If the web console is required to access the product, it is recommended to use HTTPS over HTTP

Telnet: Only enable Telnet if a command line is required to manage the product

SNMP: If using Simple Network Management Protocol for remote device monitoring and management, this should be turned on. We strongly advised to change the default community name once enabled and also set SNMP to send a trap if authentication failures happen.



#### NOTE

Once all the settings are configured according to your needs, remember to save and restart the device so that all the new settings are effective. Remember to export your settings.



#### NOTE

If all HTTP/HTTPS/Telnet/Serial consoles are turned off, then there is no other route to access the product. The only way to recover it is to reset the device and start from the beginning. Refer to the user manual on how to reset the device.

# **Limited IP Access**

Limiting the number of IP addresses that can access the product is one of the most effective ways of blocking unwanted intruders. If there are only limited desktop/notebook/mobile devices that would access the product, grant those IPs access.

## **Account and Password**

- There is a default username and password for first-time installation; it is strongly suggested to change the password after installation has been done.
- Use your own passwords for users of the devices. If possible, also change the default name of the
  account. For example, don't name admin group "admin" before the device is deployed.
- Use strong passwords. The devices support a function to check if the passwords are strong enough. You can enable the function to help you check whether the passwords are strong enough.
- Use account login failure lockout feature to prevent unwelcome access

# System Log

System log can contain all kinds of activities that are happening on your NPort, such as Login Fail, IP Changed, Password Changed, Config Changed, etc. Check the log periodically to examine any abnormal behavior.

# **Testing the Security Environment**

Besides these devices that support those protective functions, network managers can follow several recommendations to protect their network and devices.

To prevent unauthorized access to a device, follow these recommendations:

- 1. Testing tools for cybersecurity environment checks are available. Some may provide limited free use, for example, Nessus. These tools help identify possible security leaks in the environment.
- 2. The device should be operated inside a secure network, protected by a firewall or router that blocks attacks via the Internet.
- 3. Control access to the serial console as with any physical access to the device.
- 4. Avoid using insecure services such as Telnet and TFTP; the best way is to disable them completely.
- 5. Limit the number of simultaneous web server and Telnet sessions allowed. Periodically, change the passwords.
- 6. Backup the configuration files periodically and compare the configurations to make sure the devices work properly.
- Audit the devices periodically to make sure they comply with these recommendations and/or any internal security policies.
- 8. If there is a need to return the unit to Moxa, make sure encryption is disabled and that you had already backed up the current configuration before returning it.



### NOTE

DISCLAIMER: Note that the above information and guide (the "information") are for your reference only. We do not guarantee a cyberthreat-free environment; these guidelines are to increase security level to defend against cyberattacks and do not guarantee that the above information will meet your specific requirements. Furthermore, the above information is provided "as is", and we make no warranties, express, implied or otherwise, regarding its accuracy, completeness, or performance.

# 4. Choosing the Proper Operation Mode

In this chapter, we describe the NPort device server's various operation modes. The options include an operation mode that uses a driver installed on the host computer, and operation modes that rely on TCP/IP socket programming concepts. After choosing the proper operation mode in this chapter, refer to **Chapter 5** for detailed configuration parameter definitions.

## **Overview**

NPort serial device servers network-enabled traditional RS-232/422/485 devices. A serial device server is a small computer equipped with a CPU, real-time OS, and TCP/IP protocols that can bi-directionally translate data between the serial and Ethernet formats. NPort device servers that are connected to a network that with access to the Internet can be accessed from a computer located anywhere in the world.

Traditional SCADA and data collection systems rely on serial ports (RS-232/422/485) to collect data from various kinds of instruments. Since NPort serial device servers network-enabled instruments equipped with an RS-232/422/485 communication port, your SCADA and data collection system will be able to access all instruments connected to a standard TCP/IP network, regardless of whether the devices are used locally or at a remote site.

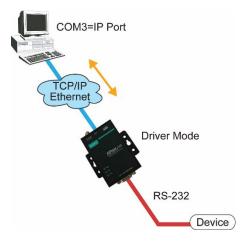
An NPort serial device server is an external IP-based network device that allows you to expand the number of serial ports for a host computer on demand. If your host computer supports the TCP/IP protocol, you won't be limited by the host computer's bus limitation (such as ISA or PCI), or lack of drivers for various operating systems.

Besides providing socket access, the NPort also comes with a Real COM / TTY driver that transmits all serial signals intact. This means that you can continue using your existing COM/TTY-based software, without needing to invest in additional software.

Three different socket modes are available: TCP Server, TCP Client, and UDP Server/Client. The major difference between the TCP and UDP protocols is that TCP guarantees delivery of data by requiring the recipient to send an acknowledgement to the sender. UDP does not require this type of verification, making it possible to offer speedier delivery. UDP also allows data to be unicast to only one IP address, or multicast to groups of IP addresses.

# **Real COM Mode**

The NPort comes equipped with COM drivers that work with Windows systems, and also TTY drivers for Linux systems. The driver establishes a transparent connection between the host and serial device by IP-Port mapping the for NPort's serial port to a local COM/TTY port on the host computer. Real COM Mode also supports up to 4 simultaneous connections, so that multiple hosts can collect data from the same serial device simultaneously.





### ATTENTION

The driver used for Real COM Mode is bundled with NPort Administrator. The driver is installed on your computer automatically when you install NPort Administration Suite.

One of the major conveniences of using Real COM Mode is that Real COM 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 host's Ethernet card. At the other end of the connection, the NPort accepts the Ethernet frame, unpacks the TCP/IP packet, and then sends it transparently to the appropriate serial device attached to one of the NPort's serial ports.



### ATTENTION

Real COM Mode allows several hosts to access the same NPort. The driver that comes with your NPort controls host access to attached serial devices by checking the host's IP address. Refer to the **Accessible IP Settings** section in **Chapter 2** for details.

# RFC2217 Mode

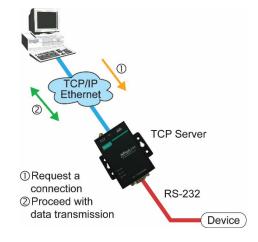
RFC2217 Mode is only supported by the NPort 5000A, NPort 5000AI-M12, NPort IA5000A, NPort 5600, and NPort 5600-8-DT/DTL Series.

RFC 2217 mode is similar to Real COM mode in that a driver is used to establish a transparent connection between a host computer and a serial device by mapping the serial port on the NPort to a local COM port on the host computer. RFC2217 defines general COM port control options based on the Telnet protocol. Third party drivers supporting RFC2217 are widely available on the Internet and can implement Virtual COM mapping to your NPort serial port(s).

# **TCP Server Mode**

In TCP Server Mode, the NPort is configured with a unique IP-Port combination on a TCP/IP network. Here, the NPort waits passively to be contacted by the host computer. After the host computer establishes a connection with the serial device, it can then proceed with data transmission. TCP Server mode also supports up to 4 simultaneous connections, so that multiple hosts can collect data from the same serial device—simultaneously. As illustrated in the figure, data transmission proceeds:

- 1. The host requests a connection from the NPort configured for TCP Server Mode.
- 2. Once the connection is established, data can be transmitted in both directions—from the host to the NPort, and from the NPort to the host.



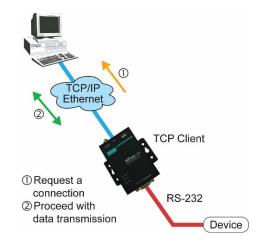
# **TCP Client Mode**

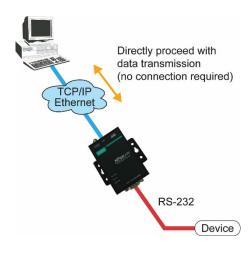
In TCP Client Mode, the NPort can actively establish a TCP connection with a pre-determined host computer when serial data arrives. After the data has been transferred, the NPort can disconnect automatically from the host computer by using the **TCP alive check time** or **Inactivity time** settings. Refer to **Chapter 5** for detailed configuration instructions. As illustrated in the figure, data transmission proceeds:

- 1. The NPort configured for TCP Client Mode requests a connection from the host.
- 2. Once the connection is established, data can be transmitted in both directions—from the host to the NPort, and from the NPort to the host.

## **UDP Mode**

Compared to TCP communication, UDP is faster and more efficient. In UDP mode, you can unicast or multicast data from the serial device to one or multiple host computers, and the serial device can also receive data from one or multiple host computers, making this mode ideal for message display applications.





## **Pair Connection Mode**

Pair Connection Mode employs two NPort units in tandem and can remove the 15-meter distance limitation imposed by the RS-232 interface. One NPort is connected from its RS-232/422/485 port to the COM port of a 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-232/422/485 port of the other NPort. The two NPort units are then connected to each other with a crossover Ethernet cable, 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 transparently transfers both data and modem control signals (although it cannot transmit the DCD signal) between the two NPorts.

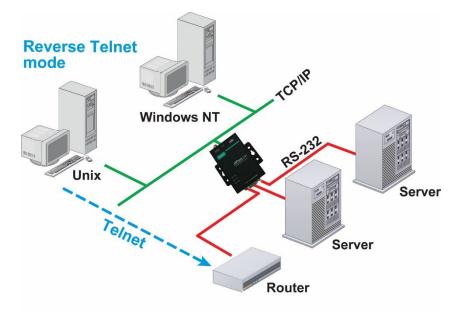
## **Ethernet Modem Mode**

# Ethernet Modem Mode is only supported by the NPort IA5000/IA5000A, NPort 5000A, NPort 5000AI-M12, and NPort 5100 Series.

Ethernet Modem Mode is designed for use with legacy operating systems, such as MS-DOS, that do not support TCP/IP Ethernet. By connecting one of NPort's serial ports to the MS-DOS computer's serial port, it is possible to use legacy software originally designed to transmit data via modem, but now transmit the data over the Ethernet.

# **Reverse Telnet Mode**

Console management is commonly used by connecting to Console/AUX or COM ports of routers, switches, and UPS units. Reverse Telnet works the same as TCP Server mode in that only one TCP port is listened to after booting up. The system then waits for a host on the network to start a connection. The difference is that the TCP Server mode does not provide the conversion function provided by Telnet. If the connected devices need to use the CR/LF conversion function when controlling, then users must choose Reverse Telnet mode.



# **PPP Mode**

PPP Mode is only supported by the NPort 5600 Series.

The NPort 5000 provides dial-in access for ISPs and enterprises that need a remote access solution. When a user at a remote site uses a PPP dial-up connection to access the NPort 5600, the NPort 5600 plays the role of a dial-up server, but also ensures that the user has legal access to the network by verifying the user's identity with the NPort 5600 User Table.

# **Disabled Mode**

When the Operation Mode for a particular port is set to **Disabled**, that port will be disabled.

# 5. Advanced Operation Mode Settings

Your NPort's serial ports can be configured to use one of several operation modes, such as Real COM mode or Reverse Telnet mode. In this chapter, we explain the settings for every parameter of every operation mode.

## **Overview**

A device port's operation mode determines how the port interacts with the network. Depending on your application and device, you may choose between two or more operating modes. For each mode, the default settings should work for most applications. Change these settings only if absolutely necessary for your application. The operation mode and related parameters can be configured through NPort Administrator. The same parameters may also be configured using the web console, Telnet console, or serial console.

### **List of Parameters**

Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	
✓	~				~	√	Connection Management Parameters
~	v √	✓ ✓		▼ ✓	¥	v	TCP alive check time
	•	•		v			Inactivity time
▼ ✓	•	•					Max connection
× ✓	▼ √	v					Ignore jammed IP
×	~						Allow driver control
✓	$\checkmark$	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>			√	Data Packing Parameters
	✓ ✓	✓ ✓	✓ ✓				Packing length
✓						~	Delimiter 1 and 2
✓	~	✓	~			~	Delimiter process
✓	$\checkmark$	~	✓			$\checkmark$	Force transmit
							Other Parameters
	~			✓	~		Local TCP port
	~						Command port
					$\checkmark$		Destination IP address
		$\checkmark$	$\checkmark$				Destination IP address 1 through 4
		~					Designated local port 1 through 4
			~				Local listen port
		✓					Connection Control
				~			Map <cr-lf></cr-lf>

## When to Make Adjustments

The default settings for each operation mode work for most applications and rarely need to be changed. However, adjustments may be required for the following situations:

- You may need to control network data packing using specific delimiter characters.
   Adjust Delimiters 1 and 2 and Delimiter process.
- Multiple hosts will simultaneously access the attached device.
   Adjust Max Connection, Ignore Jammed IP, and Allow driver control.
- Data will be broadcast from the serial device to multiple network destinations. Adjust **Destination IP 1 through 4.**
- You are using Pair Connection modes to connect two serial devices over Ethernet. Adjust Local TCP port and Destination IP Address

# **Using Pair Connection Modes**

For some applications, you may want to configure two serial devices to communicate directly with each other over the network. This can be done with a pair of NPort device servers configured for Pair Connection Master/Slave modes. Configure one device port on one of the NPorts to Pair Connection Master mode, and one device port on the other NPort to Pair Connection Slave mode. It doesn't matter which NPort is the master and which NPort is the slave.

For the device port configured for Pair Connection Slave mode, designate a Local TCP port to be used for communication. For the device port configured for Pair Connection Master mode, enter the slave's IP address and Local TCP port as the **Destination IP**.

Once both device ports have been configured, the attached serial devices will communicate over Ethernet as if they were connected by a serial cable. The two NPorts can be connected by an Ethernet cable, or they can be connected to the same network.

## **Parameter Summary**

### **Connection Management Parameters**

<ul> <li>✓</li> </ul>	<b>√</b>	<b>√</b>		<b>√</b>	<b>√</b>	<ul> <li>✓</li> </ul>		TCP alive check time
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 0 to 99 minutes Default: 7 minutes Description: Specifies the time counter to check if the TCP connection is alive. If there is no response from the other end of the connection after the specified time, then the TCP connection will be closed. A setting of 0 means disabled. This is a good practice to free up the device's resources.

	✓	✓		$\checkmark$			√	Inactivity time
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	<ul> <li>Setting Options: 0 to 65535 ms</li> <li>Default: 0</li> <li>Description: Specifies the time limit for keeping the connection open if no data flows to or from the serial device. If there is no activity for the specified time, the connection will be closed. A setting of 0 keeps the connection open even if no data is ever received.</li> <li>For many applications, the serial device may be idle for long periods of time, so 0 is an appropriate setting. If you wish to use Inactivity time with TCP Client mode, you must set Connection Control to Any Character/Inactivity Time (see Connection Control).</li> <li>When adjusting Inactivity time, make sure that it is greater than the Force transmit time. Otherwise, the TCP connection may be closed before data in the buffer can be transmitted.</li> </ul>
✓	✓	✓						Max connection
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 1 to 8 (for NPort 5100A/5200A/IA5250A/IA5450A and NPort 5150AI-M12/5250AI-M12/5450AI-M12 Series) Setting Options: 1 to 4 (for other NPort 5000 Series) Default: 1 Description: Specifies the maximum number of simultaneous connections that the port will accept. When adjusting Max connection, make sure that Ignore jammed IP and Allow driver control are also configured correctly.
Real COM Mode <	TCP Server Mode 🗸	TCP Client Mode ✓	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Ignore jammed IP Setting Options: Yes or No Default: No Description: This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the device port (see Max connection). Yes means that transmission to the other hosts will not be suspended if one IP address becomes unresponsive. No means that all transmission will be suspended if one IP address becomes unresponsive and will resume when all hosts have responded. Yes is the recommended setting when Max connection is 2 or more.
1	✓							Allow driver control
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: Yes or No Default: No Description: Specifies whether the device port will respond to driver control commands when multiple simultaneous connections are enabled (see Max connection).

## **Data Packing Parameters**

$\checkmark$	<ul> <li>✓</li> </ul>	<b>√</b>	$\checkmark$			<b>√</b>		Packing length
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 0 to 1024 Default: 0 Description: Controls data packing by the amount of data received. Serial data accumulates in the device port's buffer until it reaches the specified length. When the specified amount of data has accumulated in the buffer, the data is packed for network transmission. A setting of 0 means that data will not be packed until the buffer is full. 0 is the recommended setting, unless your application specifically needs to limit packet sizes or improve response times.
								Delimiter 1 and 2
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	<ul> <li>Delimiter 1 and 2</li> <li>Setting Options: Enable, 0 to FF</li> <li>Default: Disable</li> <li>Description: Controls data packing using special delimiter character(s).</li> <li>Serial data accumulates in the device port's buffer until the delimiter character(s) are received, after which the data is packed for network transmission. If only one delimiter character is needed, be sure to enable Delimiter 1 only. If both Delimiter 1 and 2 are enabled, both characters must be received in sequence for data packing to occur. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data is packed according to the Delimiter process parameter.</li> <li>Delimiters must be incorporated into the data stream at the software or device level.</li> </ul>



#### ATTENTION

When the device port buffer is full, the data will be packed for network transmission, regardless of the settings for Delimiter 1, Delimiter 2, and Force transmit.

$\checkmark$	<b>√</b>	<ul> <li>✓</li> </ul>	<ul> <li>Image: A start of the start of</li></ul>			$\checkmark$		Delimiter process
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	<ul> <li>Setting Options: Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter</li> <li>Default: Do Nothing</li> <li>Description: Controls how data is packed when delimiter characters are received. Note that this field has no effect if delimiters are not enabled (see Delimiters 1 and 2).</li> <li>"Do nothing" will pack the accumulated data including delimiters.</li> <li>"Delimiter + 1" will wait for an additional character before packing the accumulated data.</li> <li>"Delimiter + 2" will wait for two additional characters before packing the accumulated data.</li> <li>"Strip Delimiter" will pack the accumulated data but will not include the delimiter characters in the packet.</li> </ul>

<ul> <li>✓</li> </ul>	<b>√</b>	<ul> <li>✓</li> </ul>	<b>√</b>			<b>√</b>		Force transmit
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 0 to 65535 ms Default: 0 ms Description: Controls data packing by the time that elapses between bits of data. As serial data is received, it accumulates in the device port's buffer. If serial data is not received for the specified amount of time, the data that is currently in the buffer is packed for network transmission. A setting of 0 means that data in the buffer will not be automatically packed when additional data is not received from the device. When using this field, make sure Inactivity time is disabled or set to a larger value. Otherwise, the connection may be closed before the data in the buffer can be transmitted.

## **Other Parameters**

	<ul> <li>Image: A second s</li></ul>			<b>√</b>	<b>√</b>			Local TCP port
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	РРР Мос	Setting Options: 1 to 65535 Default: 4001 for port 1, 4002 for port 2, etc. Description: Specifies the TCP port number for communicating with the attached device. Socket applications will need to use this port number to refer to the device. For Pair Connection modes, this field specifies the slave's port number, and the same value must be used for the master's Destination IP parameter.

	<ul> <li>✓</li> </ul>							Command port
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 1 to 65535 Default: 966 Description: Specifies the TCP port number for Moxa IP-Serial Library commands. You do not need to reference this port number in your application when using the Moxa IP-Serial Library, since the library automatically gets the number from the device server. Only change this setting if there is a port number conflict with another application or device.

					<b>√</b>		<b>√</b>	Destination IP address
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: N/A Default: none Description: Specifies the IP address for the slave end of a pair connection.

		$\checkmark$	<ul> <li>✓</li> </ul>					Destination IP address 1 through 4
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: N/A Default: none Description: Specifies the network host(s) that will access the device. Serial data will be transmitted to every address listed, and network data will be sent to the device on a first-in-first-out basis.

		✓						Designated local port 1 through 4
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 1 to 65535 Default: none Description: Specifies the TCP port number that will be used for data transmission with the device port.
								l ocal listen port

			<ul> <li>✓</li> </ul>					Local listen port
	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: 1 to 65535 Default: 4001 for port 1, 4002 for port 2, etc. Description: Specifies the UDP port number for network communication to the serial device. Socket applications will need to use this port number to refer to the device.

		<b>√</b>						Connection Control
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: Startup/None, Any Character/None, Any Character/Inactivity Time, DSR On/DSR Off, DSR On/None, DCD On/DCD Off, DCD On/None Default: Startup/None Description: Specifies how connections to the device are established and closed. For example, "Startup/None" means that as soon as the device server starts up, the TCP connection is opened, and the connection can only be closed manually. "DCD On/DCD Off" means that the TCP connection is opened when the DCD signal is on, and closed when the DCD signal is off. If you want to use the Inactivity Time parameter to close the connection when the serial device is inactive, you must set Connection Control to "Any Character/Inactivity time".

				<ul> <li>✓</li> </ul>				Map <cr-lf></cr-lf>
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Setting Options: CR, LF, or CR-LF Default: CR-LF Description: Specifies how the ENTER key is mapped from the Ethernet port through the serial port. For certain terminal applications, the Enter key needs to be translated specifically as a CR character rather than CR-LF.

Operation mode codes in the configuration file are listed below:

0: Pair slave

1: Part master

2: Real COM

7: Disable

8: Reverse Telent

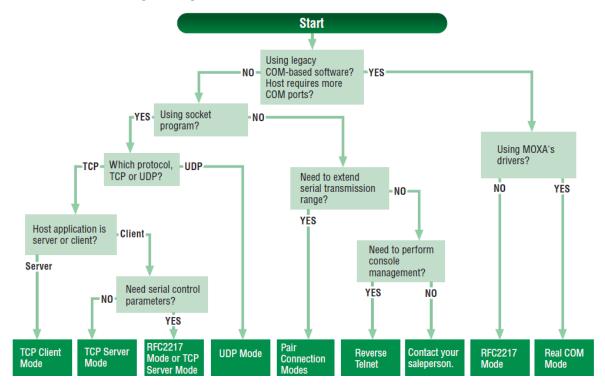
10: TCP server

12: Ethernet Modem mode

13: TCP client

- 14: UDP
- 15: PPP
- 20: RFC2217

### How to Choose Proper Operation Mode



# Web Console

Click **Operating Settings** to display the operating settings for each of the NPort's serial ports.

Ope	ating Settings					
			Operating :	Settings		- 11.
Port	Operating mode	Packing length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit
		0	0 (Disable)	0 (Disable)	Do Nothing	0
1	Real COM Mode	TCP alive che Max connecti				
		0	0 (Disable)	0 (Disable)	Do Nothing	0
2	Real COM Mode	TCP alive che Max connecti				

		- Operation	n Modes					
Overview Quick Setup	Port	Operating Mode	Packing Length	Delimiter 1		Delimiter 2	Delimiter Process	Force Transmit
Basic Settings			0	0 (Disable)		0 (Disable)	Do Nothing	0
Network Settings	1	RealCOM	TCP alive check time: Max connection:		7 1			
Serial Settings			0	0 (Disable)		0 (Disable)	Do Nothing	0
Port 1 Port 2	2	RealCOM	TCP alive check time: Max connection:		7 1			
Port 3			0	0 (Disable)		0 (Disable)	Do Nothing	0
Port 4 Operating Settings	3	RealCOM	TCP alive check time: Max connection:		7 1			
Accessible IP Settings			0	0 (Disable)		0 (Disable)	Do Nothing	0
Administration Backup/Restore	4	RealCOM	TCP alive check time: Max connection:		7 1			

### **Real COM Mode**

MOXA	www.mo	oxa.com
Main Menu	Operating Settings	
Basic Settings		Port=01
Network Settings	Operation mode	Real COM Mode
🗀 Serial Settings	TCP alive check time	7 (0 - 99 min)
Operating Settings	Max connection	1 🗸
Port 2	Ignore jammed IP	No Ves
Port 3	Allow driver control	💿 No 🔿 Yes
🗀 🗀 Port 4		Data Packing
Accessible IP Settings	Packing length	0 (0 - 1024)
Call Auto Warning Settings	Delimiter 1	0 (Hex) Enable
Change Password	Delimiter 2	0 (Hex) Enable
Load Factory Default	Delimiter process	Do Nothing V (Processed only when Packing length is 0)
Save/Restart	Force transmit	0 (0 - 65535 ms)
	Apply the above settings	to all serial ports
		Submit

Port 1				
Fort I				
Operation mode	RealCOM	\$		
TCP alive check time	7 (0 - 99 min)			
Max connection	1 \$			
Ignore jammed IP	No Yes			
Allow driver control	No Yes			
Data Packing				
Packing length	0 (0 - 1024)			
Packing length Delimiter 1	0 (0 - 1024) 00 (Hex) 🗌 Enable			
Delimiter 1	,			
	00 (Hex) Enable	essed only when par	cking length is 0)	
Delimiter 1 Delimiter 2	00 (Hex) Enable 00 (Hex) Enable	essed only when par	sking length is 0)	

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the NPort starts listening for another Real COM driver connection.</li> </ul>	Optional

Parameter	Setting	Factory Default	Description	Necessity
Max Connection	1 to 8 for NPort 5100A/ 5200A/IA5250A/ IA5450A and NPort 5150AI-M12/ 5250AI-M12/ 5450AI-M12 Series (1 to 4 for other NPort 5000 Series)		<ul> <li>Max connection is set to 2 to 8 when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a same. When Max Connection is set to 1, the Real COM driver on the specific host has full control.</li> <li>Max. Connection 1: Allows only 1 host's Real COM driver to open the specific NPort serial port.</li> <li>Max Connection 2 to 8: Allows 2 to 8 host's Real COM drivers to open the specific NPort serial port, at the same time. When multiple hosts' Real COM drivers open the serial port at the same time, the COM driver only provides a pure data tunnel without control ability. This serial port parameter will use the firmware's settings, not the settings of your application program (AP).</li> <li>Application software that is based on the COM driver will receive a driver response of "success" when the software uses any of the Win32 API functions. The firmware will only send the data back to the driver on the host. Data will be sent first-in-first-out when data comes into the NPort</li> </ul>	Required
Ignore jammed IP	No or Yes	No	from the Ethernet interface. No: When Max connections > 1, and the serial device is transmitting data, if any of the connected hosts are not responding, it will wait until the data has been transmitted successfully before transmitting the second group of data to all hosts. Yes: If you select Yes for "Ignore jammed IP," the host that is not responding will be ignored, but the data will still be transmitted to the other hosts. 0: The Delimiter Process will be followed,	Optional
Packing length	0 to 1024	0	regardless of the length of the data packet. Greater than 0: If the data length (in bytes) matches the configured value, the data will be forced out.	Optional
Delimiter 1	00 to FF	None	Once the NPort receives both delimiters through its serial port, it immediately packs all data	Optional
Delimiter 2	00 to FF	None	currently in its buffer and sends it to the NPort's Ethernet port.	Optional
Delimiter process	Do nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do nothing	[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter. [Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted. [Do nothing]: The data will be transmitted when the Delimiter is received.	Optional

Parameter	Setting	Factory Default	Description	Necessity
Force Transmit	0 to 65535 ms	0 ms	<b>0:</b> Disable the force transmit timeout. <b>1 to 65535:</b> Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame. This parameter defines the time interval during which the NPort fetches the serial data from its internal buffer. If data is incoming through the serial port, the NPort stores the data in the internal buffer. The NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.	Optional



### ATTENTION

When Max connection is set to two or more, the NPort will use a "multiconnection application" (i.e., two or more hosts are allowed access to the port simultaneously). When using a multiconnection application, the NPort will use the serial communication parameters set in the console. All of the hosts connected to that port must use the same serial settings. If one host opens the COM port with parameters that differ from the NPort's console setting, data communication may not work properly.

### NOTE

Optimal force transmit timeout differs according to your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. Here, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is:

10 (bits) / 1200 (bits/s) \* 1000 (ms/s) = 8.3 ms.

Therefore, set Force Transmit timeout greater than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be greater than 10 ms.

If you want to send the series of characters in a packet, the serial device attached to the NPort should send characters with time delay less than Force Transmit timeout between characters and the total length of data must be smaller than or equal to the NPort's internal buffer size. The serial communication buffer size of the NPort is 1 Kbyte per port.

### RFC2217 Mode

MOXA	www.n	ioxa.com
🕽 Main Menu	<b>Operating Settings</b>	
Overview		Port 1
Basic Settings		
Network Settings	Operation mode	RFC 2217 Mode
Serial Settings	TCP alive check time	7 (0 - 99 min)
Operating Settings		Data Packing
Port 1	Packing length	0 (0 - 1024)
Port 2	Delimiter 1	0 (Hex) Enable
Port 4		
Port 5	Delimiter 2	(Hex) Enable
Port 6	Delimiter process	Do Nothing V (Processed only when Packing length is 0)
Port 7	Force transmit	0 (0 - 65535 ms)
Port 8	Apply the above setti	ngs to all serial ports
Accessible IP Settings		
PPP User Table Settings		Submit
🦲 Auto Warning Settings		
🔁 Monitor		
🗎 Change Password		
🚊 Load Factory Default		
🗀 Save/Restart		

#### Web Interface for the Overall NPort 5000 Series

Port 1				
Operation mode	RFC2217	\$		
TCP alive check time	7 (0 - 99 min	)		
Local TCP port	4001			
Data Packing				
Packing length	0 (0 - 1024	ł)		
Delimiter 1	00 (Hex) 🗆 E	Enable		
Delimiter 2	00 (Hex) E	Enable		
Delimiter process	Do Nothing	(Processed only v)	when packing length is	0)
Force transmit	0 (0 - 655	i35 ms)		
Apply the above settings to	<ul> <li>P1</li> <li>All ports</li> </ul>	□ P2	□ P3	□ P4
Submit				

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the starts listening for another TCP connection.</li> </ul>	Optional

Parameter	Setting	Factory Default	Description	Necessity
Local TCP Port	1 to 65535	4001	The TCP port that the NPort uses to listen to connections, and that other devices must use to contact the NPort. To avoid conflicts with well-known TCP ports, the default is set to 4001.	Required
Packing length	0 to 1024	0	0: The Delimiter Process will be followed, regardless of the length of the data packet. Greater than 0: If the data length (in bytes) matches the configured value, the data will be forced out.	Optional
Delimiter 1	00 to FF	None	Once the NPort receives both delimiters through its serial port, it immediately packs all data	Optional
Delimiter 2	00 to FF	None	currently in its buffer and sends it to the NPort's Ethernet port.	Optional
Delimiter process	Do nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do nothing	[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter. [Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted. [Do nothing]: The data will be transmitted when the Delimiter is received.	Optional
Force Transmit	0 to 65535 ms	0 ms	<b>0:</b> Disable the force transmit timeout. <b>1 to 65535:</b> Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame. This parameter defines the time interval during which the NPort fetches the serial data from its internal buffer. If data is incoming through the serial port, the NPort stores the data in the internal buffer. The NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.	Optional

### ΝΟΤΕ

Optimal force transmit timeout differs according to your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. Here, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is:

10 (bits) / 1200 (bits/s) \* 1000 (ms/s) = 8.3 ms.

Therefore, set Force Transmit timeout to be larger than 8.3 ms. Force Transmit timeout is specified in milliseconds and must be larger than 10 ms.

If you want to send the series of characters in a packet, the serial device attached to the NPort should send characters with time delay less than Force Transmit timeout between characters and the total length of data must be smaller than or equal to the NPort's internal buffer size. The serial communication buffer size of the NPort is 1 Kbyte per port.

### **TCP Server Mode**

Web Interface for	the NPort 5100, 520	0, and IA5000 Series Only
ΜΟΧΛ	www.moxa	.com
Main Menu     Overview     Basic Settings	Operating Settings	Port=01
Basic Settings     Network Settings     Serial Settings	Operation mode TCP alive check time	TCP Server Mode
Operating Settings           Port 1	Inactivity time	0 (0 - 65535 ms)
Port 2     Port 3     Port 4	Max connection Ignore jammed IP	No Yes
Accessible IP Settings	Allow driver control	No Yes Data Packing
Monitor     Change Password	Packing length Delimiter 1	0 (0 - 1024) 0 (Hex) □ Enable
Load Factory Default	Delimiter 2 Delimiter process	0 (Hex) Enable Do Nothing (Processed only when Packing length is 0)
	Force transmit	0 (0 - 65535 ms) TCP Server Mode
	Local TCP port	4001
	Command port	966 erial ports (Local listen port will be enumerated automatically).
	Coppy and above settings to an a	Submit

#### Web Interface for Overall NPort 5000 Series

•0	perat	ion i	Mod	les

Port	1

Operation mode	TCP Server	\$					
TCP alive check time	7 (0 - 99 min)						
Inactivity time	0 (0 - 65535 ms)						
Max connection	1\$						
Ignore jammed IP	No      Yes						
Allow driver control	No Yes						
Local TCP port	4001						
Command port	966						
Data Packing							
Packing length	0 (0 - 1024)						
Delimiter 1	00 (Hex) 🗌 Enable						
Delimiter 2	00 (Hex) Enable						
Delimiter process	Do Nothing (Processed only when packing length is 0)						
Force transmit	0 (0 - 65535 m	s)					
Apply the above settings to	✓ P1	<b>P2</b>	P3	<b>P4</b>			
	All ports						
Submit							

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the NPort starts listening for another Real COM driver connection.</li> </ul>	Optional
Inactivity Time	0 to 65535 ms	0 ms	<ul> <li><b>0 ms:</b> TCP connection is not closed because of an idle serial line.</li> <li><b>0-65535 ms:</b> The NPort automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, the NPort starts listening for another TCP connection.</li> <li>This parameter determines when the TCP connection is closed or Listen status. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.</li> <li>If the inactivity time is set to 0, the current TCP connection is maintained until there is a connection close request. Although inactivity time is disabled, the NPort will check the connection status between the NPort and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, it assumes that the connection was closed down unintentionally. The NPort will then force the existing TCP connection to close.</li> </ul>	Optional
<i>Max</i> Connection	1 to 8 for NPort 5100A/ 5200A/IA5250A/ IA5450A and NPort 5150AI-M12/ 5250AI-M12/ 5450AI-M12 Series (1 to 4 for other NPort 5000 Series)	1	<ul> <li>Max connection is set to 2 to 8 when the user needs to receive data from different hosts simultaneously. The factory default only allows 1 connection at a same. When Max Connection is set to 1, the Real COM driver on the specific host has full control.</li> <li>Max. Connection 1: Allows only 1 host's Real COM driver to open the specific NPort serial port.</li> <li>Max Connection 2 to 8: Allows 2 to 8 host's Real COM drivers to open the specific NPort serial port simultaneously. When multiple hosts' Real COM drivers open the serial port at the same time, the COM driver only provides a pure data tunnel without controlling ability. This serial port parameter will use firmware settings, not the settings of your application program (AP).</li> <li>Application software that is based on the COM driver will receive a driver's response of "success" when the software uses any of the Win32 API functions. The firmware will only send the data back to the driver on the host. Data will be sent first-in-first-out when data comes into the NPort from the Ethernet interface.</li> </ul>	Required

Parameter	Setting	Factory Default	Description	Necessity
Ignore jammed IP	No or Yes	No	No: When Max connections > 1, and the serial device is transmitting data, if any of the connected hosts are not responding, it will wait until the data has been transmitted successfully before transmitting the second group of data to all hosts. Yes: If you select Yes for "Ignore jammed IP," the host that is not responding will be ignored, but the data will still be transmitted to the other hosts.	Optional
Allow Driver Control	No or Yes	No	If "max connection" is greater than 1, the NPort will ignore driver control commands from all connected hosts. However, if you set "Allow driver control" to Yes, control commands will be accepted. Note that since the NPort may get configuration changes from multiple hosts, the most recent command received will take precedence.	Optional
Packing length	0 to 1024	0	0: The Delimiter Process will be followed, regardless of the length of the data packet. Greater than 0: If the data length (in bytes) matches the configured value, the data will be forced out.	Optional
Delimiter 1	00 to FF	None	Once the NPort receives both delimiters through its serial port, it immediately packs all data	Optional
Delimiter 2	00 to FF	None	currently in its buffer and sends it to the NPort's Ethernet port.	Optional
Delimiter process	Do nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do nothing	[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter. [Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted. [Do nothing]: The data will be transmitted when the Delimiter is received.	Optional
Force Transmit	0 to 65535 ms	0 ms	<b>0</b> : Disable the force transmit timeout. <b>1 to 65535</b> : Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame. This parameter defines the time interval during which the NPort fetches the serial data from its internal buffer. If data is incoming through the serial port, the NPort stores the data in the internal buffer. The NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.	Optional
Local TCP port	1 to 65535	4001	The TCP port that the NPort uses to listen to connections, and that other devices must use to contact the NPort. To avoid conflicts with well-known TCP ports, the default is set to 4001.	Required
Command port	1 to 65535	966	The command port is a listen TCP port for IP- Serial Lib commands from the host. In order to prevent a TCP port conflict with other applications, the user can adjust the command port to another port if needed.	Optional



## ATTENTION

The Inactivity time should at least be set larger than that of Force transmit timeout. To prevent the unintended loss of data because of the session being disconnected, it is highly recommended that this value is set large enough, so that the intended data transfer is completed.



#### ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips the clearing of the buffer. If the size of the serial data received is greater than 1 KB, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

# **TCP Client Mode**

	noxa.com							
	Operating Settings							
Overview Basic Settings	Port=01							
Network Settings Operation mode	TCP Client Mode							
Serial Settings TCP alive check time	7 (0 - 99 min)							
Operating Settings     Inactivity time     Inactivity time	0 (0 - 65535 ms)							
Port 2 Ignore jammed IP	⊙No OYes							
Port 3	Data Packing							
Port 4 Packing length	0 (0 - 1024)							
Accessible IP Settings Auto Warning Settings	0 (Hex) Enable							
Monitor Delimiter 2	0 (Hex) Enable							
Change Password Delimiter process	Do Nothing 👻 (Processed only when Packing length is 0)							
Load Factory Default Save/Restart	0 (0 - 65535 ms)							
Seremestart	TCP Client Mode							
	Destination IP Address							
Destination IP address :	1 4001							
Destination IP address 2	2 : 4001							
Destination IP address 3	3 : 4001							
Destination IP address	4001							
Designated Local Port 1	5011 (0 - 65535, 0 represents assigned automatically.)							
Designated Local Port 2	5012 (0 - 65535)							
Designated Local Port 3	5013 (0 - 65535)							
Designated Local Port 4	5014 (0 - 65535)							
Connection control	Startup/None Connect on/Disconnect by)							
Apply the above set	tings to all serial ports							

Web Interface for the Overall NPort 5000 Series
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Port 1					
Operation mode	TCP Client				
TCP alive check time	7 (0 - 99 min)				
Inactivity time	0 (0 - 65535 ms)				
Ignore jammed IP	💿 No 🔵 Yes				
Destination IP address 1		Port	4001		
Destination IP address 2		Port	4001		
Destination IP address 3		Port	4001		
Destination IP address 4		Port	4001		
Designated local port 1	5011				
Designated local port 2	5012				
Designated local port 3	5013				
Designated local port 4	5014				
Connection control	Startup/None				
Data Packing					
Packing length	0 (0 - 1024)				
Delimiter 1	00 (Hex) Enable				
Delimiter 2	00 (Hex) Enable				
Delimiter process	Do Nothing \$ (Processed only w	nen packing length	is 0)		
Force transmit	0 (0 - 65535 ms)				
Apply the above settings to	P1 P2 All ports	🗆 P3		□ P4	

Parameter	Setting	Factory Default	Description	Necessity
<i>TCP Alive Check Time</i>	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort automatically closes TCP connection if there is no TCP activity for the given time. After the connection is closed, the NPort starts listening for another Real COM driver connection.</li> </ul>	

Parameter	Setting	Factory Default	Description	Necessity
Inactivity Time	0 to 65535 ms	0 ms	<ul> <li>0 ms: TCP connection is not closed because of an idle serial line.</li> <li>0-65535 ms: The NPort automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, the NPort starts listening for another TCP connection.</li> <li>This parameter determines when the TCP connection is closed or Listen status. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.</li> <li>If the inactivity time is set to 0, the current TCP connection is maintained until there is connection close request. Although inactivity time is disabled, the NPort will check the connection status between the NPort and remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, it assumes that the connection was closed down unintentionally. The NPort will then force the existing TCP connection to close.</li> </ul>	Optional
Ignore jammed IP	Yes or No	No	<ul> <li>No: When Max connections &gt; 1, and the serial device is transmitting data, if any of the connected hosts are not responding, it will wait until the data has been transmitted successfully before transmitting the second group of data to all hosts.</li> <li>Yes: If you select Yes for "Ignore jammed IP," the host that is not responding will be ignored, but the data will still be transmitted to the other hosts.</li> </ul>	Optional
Allow Driver Control	Yes or No	No	If "max connection" is greater than 1, the NPort will ignore driver control commands from all connected hosts. However, if you set "Allow driver control" to Yes, control commands will be accepted. Note that since the NPort may get configuration changes from multiple hosts, the most recent command received will take precedence.	Optional
Packing length	0 to 1024	0	0: The Delimiter Process will be followed, regardless of the length of the data packet. Greater than 0: If the data length (in bytes) matches the configured value, the data will be forced out.	Optional
Delimiter 1	00 to FF	None	Once the NPort receives both delimiters through its serial port, it immediately packs all data	Optional
Delimiter 2	00 to FF	None	currently in its buffer and sends it to the NPort's Ethernet port.	Optional
Delimiter process	Do nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do nothing	<ul> <li>[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.</li> <li>[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.</li> <li>[Do nothing]: The data will be transmitted when the Delimiter is received.</li> </ul>	Optional

Parameter	Setting	Factory Default	Description	Necessity
Force Transmit	0 to 65535 ms	0 ms	<b>0:</b> Disable the force transmit timeout. <b>1 to 65535:</b> Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame. This parameter defines the time interval during which the NPort fetches the serial data from its internal buffer. If data is incoming through the serial port, the NPort stores the data in the internal buffer. The NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.	Optional
Destination IP address 1 Destination IP	IP address or Domain Name (E.g., 192.168.1.1)	None	Allows the NPort to connect actively to the remote host (up to 4 hosts) whose IP address is set by this parameter. The "Destination IP address" parameter can use either IP address or Domain Name. For some applications, the user may need to send the data	Required
address 2/3/4 Designated Local Port 1/2/3/4	TCP Port No.	5011 (Port 1) 5012 (Port 2) 5013 (Port 3) 5014 (Port 4)	actively to the remote destination domain name.	Required
<i>Connection</i> <i>control</i>	Startup/None, Any Character/ None, Any Character/ Inactivity Time, DSR ON/ DSR OFF, DSR ON/None, DCD ON/ DCD OFF, DCD ON/None		The meaning of each of the above settings is given in the table below. Both the Connect condition and Disconnect condition are given.	Required

Connect/Disconnect	Description
Startup/None (default)	A TCP connection will be established on startup and will remain active indefinitely.
Any Character/None	A TCP connection will be established when any character is received from the serial
Any Character/None	interface and will remain active indefinitely.
Any Character/	A TCP connection will be established when any character is received from the serial
Inactivity Time	interface and will be disconnected when the Inactivity timeout is reached.
DSR On/DSR Off	A TCP connection will be established when a DSR "On" signal is received and will be
DSK ON/DSK ON	disconnected when a DSR "Off" signal is received.
DSR On/None	A TCP connection will be established when a DSR "On" signal is received and will
DSK ON/NONE	remain active indefinitely.
DCD On/DCD Off	A TCP connection will be established when a DCD "On" signal is received and will be
	disconnected when a DCD "Off" signal is received.
DCD On/None	A TCP connection will be established when a DCD "On" signal is received and will
	remain active indefinitely.



### ATTENTION

The Inactivity time should at least be set larger than that of Force transmit timeout. To prevent the unintended loss of data because of the session being disconnected, it is highly recommended that this value is set large enough, so that the intended data transfer is completed.

Inactivity time is ONLY active when "TCP connect on" is set to "Any character."



#### NOTE

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips the clearing of the buffer. If the size of the serial data received is greater than 1 KB, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.



#### ATTENTION

Up to four connections can be established between the NPort and hosts. The connection speed or throughput may be low if one of the four connections is slow since the slow connection will slow down the other three connections.

### **UDP Mode**

Port 1						
Operation mode	UDP	\$				
	Begin	End		Port		
Destination IP address 1			:	4001		
Destination IP address 2			:	4001		
Destination IP address 3			:	4001		
Destination IP address 4			:	4001		
Local listen port	4001					
Data Packing						
Packing length	0 (0 - 1024)					
Delimiter 1	00 (Hex) 🗌 Ena	ble				
Delimiter 2	00 (Hex) Ena	ble				
Delimiter process	Do Nothing \$	(Processed only v	when packing le	ength is 0)		
Force transmit	0 (0 - 65535	ms)				
Apply the above settings to	✓ P1	<b>P2</b>	□ <b>P</b> 3		P4	
Apply the above actinga to	All ports					

Parameter	Setting	Factory Default	Description	Necessity
Packing length	0 to 1024	0	0: The Delimiter Process will be followed, regardless of the length of the data packet. Greater than 0: If the data length (in bytes) matches the configured value, the data will be forced out.	Optional
Delimiter 1	00 to FF	None	Once the NPort receives both delimiters through its serial port, it immediately packs all	Optional
Delimiter 2	00 to FF	None	data currently in its buffer and sends it to the NPort's Ethernet port.	Optional

Parameter	Setting	Factory Default	Description	Necessity
Delimiter process	Do nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do nothing	<ul> <li>[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.</li> <li>[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.</li> <li>[Do nothing]: The data will be transmitted when the Delimiter is received.</li> </ul>	Optional
Force Transmit	0 to 65535 ms	0 ms	<b>0:</b> Disable the force transmit timeout. <b>1 to 65535:</b> Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame. This parameter defines the time interval during which the NPort fetches the serial data from its internal buffer. If data is incoming through the serial port, the NPort stores the data in the internal buffer. The NPort transmits data stored in the buffer via TCP/IP, but only if the internal buffer is full or if the force transmit time interval reaches the time specified under Force Transmit timeout.	Optional
Destination IP address 1	IP address range E.g., Begin:	Begin: Empty	N/A	Required
Destination IP address 2/3/4	192.168.1.1 End: 192.168.1.10	End: Empty Port: 4001	N/A	Optional
Local listen port	1 to 65535	4001	The UDP port that the NPort listens to, and that other devices must use to contact the NPort. To avoid conflicts with well-known UDP ports, the default is set to 4001.	Required

# NOTE

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips the clearing of the buffer. If the size of the serial data received is greater than 1 KB, the NPort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

#### **UDP Multicast**

A multicast is a packet sent by one host to multiple hosts. In multicast mode, each host that belongs to a specific multicast group will receive multicast packets for that group. For a host to be configured as a multicast receiver over the Internet, the must inform the routers on its LAN. The Internet Group Management Protocol (IGMP) is used to communicate group membership information between hosts and routers on a LAN. The NPort 5000 Series supports IGMP version 2. The NPort 5100, NPort 5200, IA5000 Series do not support IGMP function.

Port 1				
Operation mode	UDP	\$		
	Begin	End	Р	ort
Destination IP address 1	239.1.1.1		: 400	)1
estination IP address 2			: 400	01
Destination IP address 3			: 400	01
Destination IP address 4			: 400	01
Local listen port	4001			
ocal listen port Data Packing	4001 0 (0 - 1024)			
ocal listen port Data Packing Packing length		able		
ocal listen port Data Packing acking length lelimiter 1	0 (0 - 1024) 00 (Hex) Ena	able		
	0 (0 - 1024) 00 (Hex) Ena 00 (Hex) Ena			
Local listen port Data Packing Packing length Delimiter 1 Delimiter 2	0 (0 - 1024) 00 (Hex) Ena 00 (Hex) Ena	able (Processed only whe		

Type the IP address (e.g., 239.1.1.1) assigned to the multicast group in the **Begin** column. The NPort will automatically add the Group, and receive all packets from this group as required by the multicast function.

### **Pair Connection Mode**

Pair Connection Mode employs two NPort device servers in tandem, and can be used to remove the 15meter distance limitation imposed by the RS-232 interface. One NPort is connected from its RS-232 port to the COM port of a PC or other type of computer, such as a hand-held PDA, and the serial device is connected to the RS-232 port of the other NPort. The two NPort device servers are then connected to each other with a crossover Ethernet cable, 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 transparently transfers both data and modem control signals (although it cannot transmit the DCD signal) between the two NPort device servers.

#### **Pair Connection Master Mode**

When using Pair Connection Mode, you must select **Pair Connection Master Mode** for the Operation Mode of one of the NPort device servers. In effect, this NPort will act as a TCP client.

Web Interface for the NPort 5100, 5200, and IA5000 Series Only								
MOXA www.moxa.com								
Alin Menu Operating Settings								
Basic Settings		Port=1						
<ul> <li>Network Settings</li> <li>Serial Settings</li> </ul>	Operation mode	Operation mode Pair Connection Master Mode -						
Derating Settings	TCP alive check time	7 (0 - 99 min)						
Port 1 Port 2	Destination IP address 192.168.1.1 :4001							
🗀 Accessible IP Settings	□ Apply the above settings to all serial ports							
<ul> <li>Auto Warning Setting</li> <li>Monitor</li> <li>Change Password</li> </ul>	Submit							
Load Factory Default								

• Operation M	Iodes					
Port 1						
peration mode	Pair Connectio	n Master 🖨				
CP alive check time	7 (0 - 99 min	)				
estination IP address				Port 4001		
pply the above settings to	✓ P1	□ P2	🗆 P3		□ <b>P</b> 4	
pply the above settings to	All ports					

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort closes the TCP connection automatically if there is no TCP activity for the given time.</li> </ul>	Required
Destination IP address	IP address or Domain Name (E.g., 192.168.1.1)	blank	The Pair Connection "Master" will contact the network host that has this IP address. Data will be transmitted through the port No. (4001 by default). Note that you must configure the same TCP port No. for the device server acting	
	TCP Port	4001	as the Pair Connection "Slave."	Required

#### **Pair Connection Slave Mode**

When using Pair Connection Mode, you must select **Pair Connection Slave Mode** for the Operation Mode of one of the NPort device servers. In effect, this NPort will act as a TCP server.

Web Interface for the NPort 5100, 5200, and IA5000 Series Only							
MOXA www.moxa.com							
Main Menu     Operating Settings     Overview							
Basic Settings Network Settings		Port=1					
Serial Settings	Operation mode	Pair Connection Slave Mode 💌					
🖻 🔄 Operating Settings	TCP alive check time	7 (0 - 99 min)					
Port 1 Port 2	Local TCP port	4001					
C Accessible IP Settings							
<ul> <li>Auto Warning Setting</li> <li>Monitor</li> <li>Change Password</li> </ul>	1	Submit					

Web Interface fo	r the Ove	erall NPort 5	5000 Series	
• Operation M	lodes			
Port 1				
Operation mode	Pair Connecti	on Slave		
TCP alive check time	7 (0 - 99 mir	n)		
Local TCP port	4001			
Apply the above settings to	✓ P1 O All ports	□ P2	P3	□ P4
Submit				

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort closes the TCP connection automatically if there is no TCP activity for the given time.</li> </ul>	Required
Local TCP port	TCP port No. (e.g., 4001)	4001	This Port No. must be the same port No. that you set up for the Pair Connection "Master" device server.	Required

# Ethernet Modem Mode (for the NPort IA5000/IA5000A, NPort 5000A, NPort 5000AI-M12, NPort 5100 Series only)

Web Interface for the NPort 5100 and IA5000 Series Only					
MOXA	www.moxa.	com			
🖼 Main Menu 🗀 Overview	Operating Settings				
Basic Settings		Port=01			
Network Settings	Operation mode	Ethernet Moder			
Serial Settings	TCP alive check time	7 (0 - 99 min)			
Operating Settings     Operating Settings	Local TCP Port	4001			
C Accessible IP Settings					
🖲 🗋 Auto Warning Settings		Submit			
t 🔁 Monitor					

#### Web Interface for the NPort IA5000A, 5000A, and 5000AI-M12 Series Only

• Operation M	• Operation Modes				
Port 1					
Operation mode	Ethernet Modem	\$			
TCP alive check time	7 (0 - 99 min)				
Local TCP port	4001				
Apply the above settings to	✓ P1 All ports	□ P2	P3	□ P4	
Submit					

#### Dial-in

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

#### ATS0=0 (default):

The NPort will temporarily accept the TCP connection and then send the **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≥0:

The NPort will accept the TCP connection immediately and then send the **CONNECT <baud>** command to the serial port, in which <baud> represents the baudrate of the NPort's serial port. After that, the NPort immediately enters data mode.

#### **Dial-out**

The NPort accepts the AT command **ATD <IP>:<TCP port>** from the serial port and then requests a TCP connection from the remote Ethernet Modem or PC. This is where **<IP>** is 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 unit accepts this TCP connection, the NPort will send out the **CONNECT <baud>** signal via the serial port and then enter data mode.

#### **Disconnection Request from the Local Site**

When the NPort is in data mode, the user can drive the DTR signal to OFF, or send **+++** from the local serial port to the NPort. The NPort will enter command mode and return **NO CARRIER** via the serial port, and then input **ATH** to shut down the TCP connection after 1 second.

# NOTE

The "+++" command cannot be divided. The "+" character can be changed in register S2, and the guard time, which prefixes and suffixes the "+++" in order to protect the raw data, can be changed in register S12.

#### **Disconnection Request from the Remote Site**

After the TCP connection has been shut down by the remote Ethernet modem or PC, the NPort will send the **NO CARRIER** signal via the serial port and then return to command mode.

#### **AT Commands**

The NPort supports the following common AT commands used with a typical modem:

No.	AT command	Description	Remarks
1	ΑΤΑ	Answer manually	
2	ATD <ip>:<port></port></ip>	Dial up the IP address: Port No.	
3	ATE	ATE0=Echo OFF	
3	ATE	ATE1=Echo ON (default)	
4	ATH	ATH0=On-hook (default)	
4	АП	ATH1=Off-hook	
5	ATI, ATI0, ATI1, ATI2	Modem version	reply "OK" only
6	ATL	Speaker volume option	reply "OK" only
7	ATM	Speaker control option	reply "OK" only
8	ΑΤΟ	Online command	
9	ATP, ATT	Set Pulse/Tone Dialing mode	reply "OK" only
10	ATQ0, ATQ1	Quiet command (default=ATQ0)	
11	ATSr=n	Change the contents of S register	See "S registers"
12	ATSr?	Read the contents of S register	See "S registers"
		Result code type	
		ATV0 for digit code	
		ATV1 for text code	
13	ATV	0=0K	
15	ATV	1=connect (default)	
		2=ring	
		3=No carrier	
		4=error	
14	ATZ	Reset (disconnect, enter command mode and restore	
14		the flash settings)	
		Serial port DCD control AT&C0=DCD always on	
15	AT&C	AT&C1=DTE detects connection by DCD on/off	
		(default)	
		Serial port DTR control AT&D0=recognize DTE always	
16	AT&D	ready AT&D1, AT&D2=reply DTE when DTR On	
		(default)	
17	AT&F	Restore manufacturer's settings	
18	AT&G	Select guard time	reply "OK" only
19	AT&R	Serial port RTS option command	reply "OK" only
20	AT&S	Serial port DSR control	reply "OK" only
21	AT&V	View settings	
22	AT&W	Write current settings to flash for next boot up	

#### **S** Registers

No.	S Register	Description & default value	Remarks
1	S0	Ring to auto-answer (default=0)	
2	S1	Ring counter (always=0)	no action applied
3	S2	Escape code character (default=43 ASCII "+")	
4	S3	Return character (default=13 ASCII)	
5	S4	Line feed character (default=10 ASCII)	
6	S5	Backspace character (default= 8 ASCII)	
7	S6	Wait time for dial tone (always=2, unit=sec)	no action applied
8	S7	Wait time for carrier (default=3, unit=sec)	
9	S8	Pause time for dial delay (always=2, unit=sec)	no action applied
10	S9	Carrier detect response time (always=6, unit 1/10 sec)	no action applied
11	S10	Delay for hang up after carrier (always=14, unit 1/10 sec)	no action applied
12	S11	DTMF duration and spacing (always=100 ms)	no action applied
13	S12	Escape code guard time (default=50, unit 1/50 sec) to control the idle time for "+++"	

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	7 min.	<ul> <li>0 min.: TCP connection is not closed because of an idle TCP connection.</li> <li>1 to 99 min.: The NPort closes the TCP connection automatically if there is no TCP activity for the given time.</li> </ul>	Required
Local TCP port	1 to 65535	4001	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

# **Reverse Telnet Mode**

Web Interface for	the NPort 5100, 5200 www.moxa	, and IA5000 Series Only .com
🔁 Main Menu 🔲 Overview	Operating Settings	Port=01
Basic Settings     Network Settings	Operation mode	Reverse Teinet Mode
🗉 🗀 Serial Settings	TCP alive check time	7 (0 - 99 min)
Operating Settings Port 1	Inactivity time	0 (0 - 65535 ms)
Port 2	Local TCP port	4001
Port 3	Map <cr-lf></cr-lf>	CR-LF V
Port 4     Accessible IP Settings	Apply the above settings to all	serial ports
Accessible iP Settings		Submit

Web Interface for the Overall NPort 5000 Series				
Web Intertace for the Overall NPort 5000 Series				-
	web Interface	for the Overall	I NPORT 5000 Se	ries

• Operation M	lodes			
Port 1				
Operation mode	Reverse Telnet	t \$		
TCP alive check time	7 (0 - 99 min	)		
Inactivity time	0 (0 - 655	35 ms)		
Local TCP port	4001			
Map <cr-lf></cr-lf>	CR-LF \$			
Apply the above settings to	<ul> <li>P1</li> <li>All ports</li> </ul>	P2	P3	□ P4
Submit				

Parameter	Setting	Factory Default	Description	Necessity
TCP Alive Check Time	0 to 99 min.	0 min.	Specifies the time slice for checking if the TCP connection is alive. If no response is received, the NPort will disconnect the original connection.	Optional
Inactivity time	0 to 65535 ms	0	Idle time setting for auto-disconnection. 0 min. means it will never disconnect.	Optional
Local TCP port	1 to 65535	4001	Each of the NPort's serial ports is mapped to a TCP port. To avoid conflicts with TCP ports, set port numbers to 4001 for port1, 4002 for port 2, etc. (like the default values).	Optional
Map <cr-lf></cr-lf>	CR, LF, or CR- LF	CR-LF	<ul> <li>If data received through the NPort's Ethernet port is sent using the "enter" command, the data will be transmitted out the serial port with an added:</li> <li>1. "carriage return + line feed" if you select the <cr-lf> option (i.e., the cursor will jump to the next line, and return to the first character of the line)</cr-lf></li> <li>2. "carriage return" if you select the <cr> option (i.e., the cursor will return to the first character of the line)</cr></li> <li>3. "line feed" if you select the <lf> option. (i.e., the cursor will jump to the next line, but not move horizontally)</lf></li> </ul>	Optional

#### **PPPD Mode**

com				>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Networking
Operation Modes					
Port 1 Application Mode Destination IP address Source IP address Source IP address IP netmask TCP/IP compression Inactivity time Link quality report Username Password	Dial in/out  PPPD  Enable  Disable  Control  Contro  Control  Control  Control  Control  Cont				
Authentication type Try next type on authentication denied Disconnect by Apply the above settings to	None • Enable • Disable None • • P1 • All ports	■ P2	III P3	■ P4	
	Operation Modes Port 1 Application Mode Destination IP address Source IP address TCP/IP compression Inactivity time Link quality report Username Password Authentication type Try next type on authentication denied Disconnect by	Operation Modes Port 1 Application Mode Port 0 Port 1 Mode PPPD    Destination IP address Source IP address Source IP address IP netmask (CP/IP compression Inactivity time 0 (0 - 65535 ms) Link quality report 0 Enable * Disable Password Authentication type Try next type on authentication denied Disconnect by None PI	Operation Modes Port 1 Application Mode PPPD    Destination IP address Source IP address Source IP address IP netmask ICP/IP compression Inactivity time 0 0 0 - 65535 ms) Link quality report Enable    Disable Disab	Operation Modes       Port 1       Application     Dial in/out •       Mode     PPPD •       Destination IP address	Port 1 Po

PPPD (PPP on demand) is used for dial-in services since it provides PPP services only when receiving a request from a remote PC.

Destination IP address: This is the IP address of the remote dial-in/ dial-out server.

Source IP address: The Source IP address is IP address assigned to this serial port.

IP netmask: The IP netmask defines the netmask, also known as the subnet mask, for the PPP connection

**TCP/IP compression (default=Disable)**: The setting of this field depends on whether the remote user's application requests compression.

**Inactivity time** (default=0 ms): This field specifies the idle time setting for auto-disconnection. A setting of 0 ms will cause the port to remain connected even if idle.

**Link quality report (default=Disable)**: Setting this field to **Enable** allows the NPort 5000 to disconnect a connection if the link noise exceeds a certain threshold.

Username: This is the dial-out user ID account.

**Password**: This is the dial-out user password.

**Authentication type (default=None)**: This field allows you to configure the method used, if any, to verify a user's ID and authorization.

Option	Description
Local	Verify the ID against the NPort 5000 User Table.
RADIUS	Verify the ID against the external RADIUS server.
RADIUS-Local	Radius authentication is tried first, switching to Local if unsuccessful.
Local-RADIUS	Authentication is performed locally first, switching to Radius if unsuccessful
TACACS+	Verify the ID against the external TACACS+ server.
TACACS+-Local	TACACS+ authentication is tried first, switching to Local if unsuccessful.
Local-TACACS+	Authentication is performed locally first, switching to Radius if unsuccessful
None	Authentication is not required.

**Try next type of authentication denied** (default=Disable): The field enables or disables the system to try next type on first authentication denied.

**Disconnect by** (default=None): If this field is set as **DCD-off**, the connection will be disconnected when the DCD signal is off. If this field is set as **DSR-off**, the connection will be disconnected when the DSR signal is off.

# **Disabled Mode**

Main Menu ] Overview	Operating Settings		
Basic Settings		Port=01	
Network Settings	Operation mode	Disabled	
Serial Settings	Apply the above sett	ings to all serial ports	
Operating Settings     Port 1     Port 2		Submit	
	ir the Overall NPC	ort 5000 Series	
eb Interface fo			

Apply the above settings to	P1 All ports	□ P2	□ P3	□ P4
Submit				

When Operation mode is set to Disabled, that port will be disabled. Select the **Apply the above settings to all serial ports** checkbox to apply this setting to the other ports.

NPort **Real COM** driver can be installed by installing NPort Administrator Suite or NPort Windows Driver Manager is intended for use with NPort 5000 serial ports that are set to **Real COM** mode. The software manages the installation of drivers that allow you to map unused COM ports on your PC to serial ports on the NPort 5000. When the drivers are installed and configured, devices that are attached to serial ports on the NPort 5000 will be treated as if they were attached to your PC's own COM ports.

For how to configure NPort by NPort Administrator Suite or how to use Windows Driver Manager for COM mapping, refer to **Chapter 7. Windows Utilities for NPort**.

# 7. Windows Utilities for NPort 5000 Models

# **Device Search Utility (DSU)**

# **Installing Device Search Utility**

Double-click the **Device Search Utility** installer, which you download from the Moxa website and follow the installation steps to complete the setup.

# Configuring by Device Search Utility v3.x

# **Find the Device**

The default IP address of each NPort 6000-G2 Series is https://192.168.127.254. Directly input the IP address at the address bar of a browser to open the web console to set up the first username and password. Or download the **Device Search Utility (DSU) v3.0** and search for the device to access its web console.

MOXA <sup>®</sup> Dev	ice Search Ut	ility					a	•
Search Device	~					⊘ ~	P v	
Please click sear	ch device butto	on					幸	:
Seq.	ê	Model	Lan1 IPv4	Lan1 MAC	Firmware Version			
No Devices								
				Items	per page: 10    0 of 0	<	< >	>1

DSU is a handy tool for easily finding NPort device servers and deploying single or multiple devices. DSU v3.0 functions as a web-based application that works on Chrome, Firefox and (Microsoft) Edge.

To use the web-based application DSU v3.0, your browser version and operating system must meet certain minimum requirements:

- Chrome:
  - > For Windows 7, 8/8.1, Server 2012 and Server 2012 R2: Chrome 109 and newer
  - > For Windows 10 and newer, Server 2016 and newer: All Chrome versions
- Firefox:
  - > For Windows 7 and newer versions, Server 2012 and newer versions: All Firefox ESR versions
- Edge:

NOTE

> For Windows 7 and newer versions, Server 2012 and newer versions: All Firefox ESR versions

For detailed instruction of how to use **DSU**, download the user manual from moxa.com.

#### **Search Device**

Device Search Utility			Ċ	•
Search Device V	• > ~	⊘ ~	IP ~	

When connecting the NPort device server to the network, the DSU's **Search Device** function for him to find the target NPort device server. Searching can be done in three different ways. To see the options, click on the pull-down menu:

Search	Default button action. It will search the devices by multicasting.		
Search by IP	Search the device by a specific IP		
Search by IP range	Search the device in a certain IP range; the search results will only display the corresponding IP type. For example, if you search by IPv4, only IPv4 values will be displayed.		
Search Device 🗸			

It's possible to stop the search at any stage of the process. A **STOP** button appears on top of the table; click it to halt the search and keep the already searched devices on the list.

to abort.

STOP

The default search time is 10 seconds. DSU will continue searching until time runs out. If your device(s) does not appear, you may change the search timeout limit in **Preferences > Device Search > Timeout limit for device searching**, to give the network a bit more time to respond.

### First-time login with Device Search Utility

Searching ••• Device(s) found, or you can press

To address cybersecurity concerns, the NPort device server found through DSU will prompt for an account name and password during the first login.

Search	Device 🗸				2 (
lease sel	ect device(s)				
No.	Ô	Device Name	Model Name	Lan1 IPv4	Lan1 MAC
1	Â	NP5450I_4850	NPort 5450I	192.168.1.222	00:90:E8:9A:E0:BF
2 🤇	6	NP6250_15731	NPort 6250	192.168.127.254	00:90:E8:7D:8D:AD
3	Â	NP6150_15012	NPort 6150	192.168.127.254	00:90:E8:61:50:12

Select the target device 0 and click the unlock button 1. The login window will remind you to set up the account name and password, and it will show the password minimum requirements as tips below the password field.

	est time to unlock the new eed to setup the account word.
Account	
moxa	
	З

Once you configure the first account and password successfully, the device may restart. After completing a new search, the lock icon will change to **Advance** type:

Please sele	ct device(s)					
No.	Ê	Device Name	Model Name	Lan1 IPv4	Lan1 MAC	Firmv
1	Â	NP5450I_4850	NPort 5450I	192.168.1.222	00:90:E8:9A:E0:BF	3.14
2	Â	NP6150_15012	NPort 6150	192.168.127.254	00:90:E8:61:50:12	2.2
3	۵	NP6250_15731	NPort 6250	192.168.127.254	00:90:E8:7D:8D:AD	2.2.2

If there is an error during the unlocking process, like entering the wrong password, you will be notified with an error message at the bottom right of the screen.

ge: 10 ▼ 1 - 2 of 2	1<	<	>	
			-	
Unlock fail				~
Unlock fail				

### Unlock



When selecting one or multiple NPort device servers, use can click the **Unlock** button to unlock them. Because of different product series, there are four types of the login permission types:

	Login Permission Type	Definition				
b	Default	The device has not completed the first-time login process, which requires setting the first account name and password.				
B	Basic	The device only has password protection; the login requires inputting the password only.				
A	Advance	The device has username and password protection; the login requires inputting both account name and password.				
ŀ	Legacy/Unlocked	The device is unlocked, or not requiring any protection to log in.				

To unlock multiple devices at once, they must be of the same model name.



#### NOTE

The DSU solely facilitates unlocking the device; for account name or password changes, you must access the web console and find the Account Management function.

# **Assign IP**



The device(s) needs to be unlocked before the **Assign IP** function can be used.

Assign IPv4 or IPv6 (if supported) for the device. Clicking the button will show you all the options under **Assign IP**:

- Assign IPv4
- Assign IPv6
- Assign IPv4 & IPv6

If your device does not support certain options, they will be disabled.

#### **Assign IPv4**

Mode: Static or DHCP

Click on the field of IP Address, Subnet Mask, Default Gateway - opt, to manually key in the values.

If you have selected multiple devices and the specific IP is not required for each device, you may consider using **ASSIGN IP SEQUENTIALLY** to quickly set up an IP. The function increments the IP address based on the IP value of the first device on the list.

3 Dev	vice(s)			ASSIGN IP SEQUENTIALLY
No.	Model Name & Mac	IP Address	Subnet Mask	Default Gateway - opt.
1	NPort 54501 00:90:E8:9A:E0:BF	192.168.1.222	255.255.255.0	· · ·
2	NPort 5210A 00:90:E8:AD:45:6A	192.168.1.223	255.255.255.0	!
3	NPort 5210A 00:90:E8:AD:45:10	192.168.1.224	255.255.255.0	

#### Clone "Network Mask"/"Default Gateway" to All Devices

This is a quick way to copy and paste Netmask or gateway values to all the selected devices. Edit **Subnet Mask** and **Default Gateway – Opt** of any device first, and find the options in the menu icon at the end of the list and apply:

No.	Model Name & Mac	IP Address	Subnet Mask	Default Gateway - opt.
1	NPort 5450I 00:90:E8:9A:E0:BF	192.168.1.222	255.255.255.0	
2	NPort 5210A	192.168.127.254	255.255.255.0	Clone "Network Mask" to all devices
				Clone "Default Gateway" to all devices

#### Assign IPv6

Mode: Static or DHCP

Click on the field of IP Address, Prefix, Default Gateway - opt, to manually key in the values.

If you have selected multiple devices and specific IP is not required for each device, you may consider using **ASSIGN IP SEQUENTIALLY** to quickly set up an IP. The function increments the IP address based on the IP value of the first device in the list .

	IPv4	IPv6		
de				
atic		•		
2 Dev	vice(s)			ASSIGN IP SEQUENTIALLY
No.	Model Name & Mac	IP Address	Prefix	Default Gateway - opt.
1	NPort 6150 00:90:E8:61:50:12	fe80::290:e8ff:fe61:5012	64	i
2	NPort 6250 00:90:E8:7D:8D:AD	fe80::290:e8ff:fe61:5013	64	í

#### Clone "Network Mask"/"Default Gateway" to all devices

This is a quick way to copy and paste Prefix or gateway value to all the selected devices. Edit **Prefix** and **Default Gateway – Opt** of any device first, and find the options in the menu icon at the end of the list and apply:

	IPv4	IPv6			
<sup>ode</sup> tatic		*			
2 Dev	ice(s)			ASSIGN IP SEQUENTIALLY	
No. Model Name & Mac		IP Address	Prefix	Default Gateway - opt.	
	NPort 6150 00:90:E8:61:50:12	fe80::290:e8ff:fe61:5012	64		
1	00.70.20.01.00.12				

#### Apply the changes

After you have set everything, click **ASSIGN & RESTART** to restart your device(s) and set a new IP. DSU should display the result, whether it is successful or failed, in the **Status & Message** columns of each device.

signing IP and restart	ting for 3 device(s)			
Device Name	Model Name	Status	Message	Last Updated Time
NP54501_4850	NPort 5450I	C Progressing	Processing	Feb 06, 2024 14:41:35
NP5210A_8295	NPort 5210A	8 Failed	Session timeout. Please retry.	Feb 06, 2024 14:41:35
NP5210A_8205	NPort 5210A	Success	Success.	Feb 06, 2024 14:41:35

# **COM Mapping**

Device Search Utility		(i) 🌣
Search Device V	с <u>Б</u>	~ • • III
Please click search device button		🛱 Firmware Upgrade
Seq. 🔒 Model Lan1 IPv4 La	an1 MAC Firmware 1	Multiple Configuration
		A Export Configuration
No Devices		G Import Certificate
	ltems per page: 10 ▼ 0 c	E Allowlist
		2) Restart
	1	Reset
	[	📾 COM Mapping

After setting up the first user account, password and IP address, if the software to communicate with the

serial devices by opening a COM port/TTY port, you can click the **More functions** to find **COM Mapping** function for next step. Refer to the <u>Configuring by NPort Windows Driver Manager</u> section under Chapter 7, "Windows Utilities for NPort 5000 Models," for more information.

### Console



When you want to configure more detail settings, click the **Console** button  $\Sigma$   $\sim$  to connect to the HTTPS console of the NPort 6000-G2 Series.

For how to use web console for configuration, refer to <u>Configuration by Web Console</u> section under the Chapter 2. Getting Started.

#### Locate

Device Search Utility	Ű 🌣
Search Device V	

Unlock the device before you can use the **Locate** function.

This is to locate the device by triggering the buzzer to help you find the target device server easily. Clicking the button would show all options of **Locate**. If your device does not support certain options, they will be disabled:

- Locate (IPv4)
- Locate (IPv6)

# **Configuring by Device Search Utility v2.7**

#### Search

Before configuring the NPort, you will need to find it on the network first. The Broadcast Search function is used to locate all NPort 5000 servers that are connected to the same LAN as your computer.

DSU D								<u></u>	
<u>F</u> ile F <u>u</u> n	nction	⊻iew <u>H</u> elp							
<u>E</u> xit		🔮 🤮 Search Search	≝ IP Locate D	onsole Assign IP Ur		A &			
No 🛆	Mod	177.	LAN1 MAC Address	LAN1 IP Address	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
-									
<u>E</u> xit		Quit DSU							
2		Duesdeset	h annuah fau	daviana					
<u>S</u> earc	h	Broadcast	t search for	devices					
Search		Search de	evice by spe	cific IP					
 Locat	te	Locate the	e device by	beeping it					
<u>C</u> onso	ole	Access th	e device thr	ough consoles	5				
P		Assian IP	to a device						
<u>A</u> ssign	ΙP	Assign IP to a device							
Un-Lo	-	Unlock th	e device bet	ore anything	else				
I <u>m</u> por	rt	Import co	onfiguration	file to a devic	e				
			<b>a</b>						
E <u>x</u> por	rt	Export co	nfiguration	file from a dev	/ice				
- 🛃		Ungrade f	firmware of	a device					
	de	opyradei							

In DSU, click **Search** to search your LAN for NPort device servers, or right-click to find **Search** function. Since the Broadcast Search function searches for MAC address and not IP address, all NPort 5000 servers connected to the LAN will be located, regardless of whether they are part of the same subnet as the host.

When your unit appears in the search results, you may click **Stop** to end the search or wait a few more moments for the search to complete.

	g for devices			Show IPv6 Address	s <u>S</u> top
	Device(s), 9 second				
<u>No</u>	Model NPort 5430 V3	LAN1 MAC Address 00:90:E8:9A:DF:7F	LAN1 IP Address 192.168.127.254	LAN2 MAC Address	LAN2 IP Address
'	NFUIL 3430 V3	00.30.E0.3A.DF.7F	132.100.127.234		

When the search is completed, all NPort 5000 serial device servers that are located are displayed in the DSU window. Select the device you wish to access and press the **Unlock** button to input the username and password for the device.

🔎 DSU									-		×
<u>File</u> F <u>u</u> n	ction ⊻iew <u>H</u> elp										
<u>E</u> xit		✿ 塗 ⊑ arch IP Locate Con	sole Assign IP	Un-Lock	Export	Upgrade					
No 🛆	Model	LAN1 MAC Address	LAN1 IP Address	Input Password	to un-lock N	Port. ddress	Status	Firmware Version	n	1	
🔒 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254					Ver3.14 Build 21	032913		
		Password Unlock Ir User N Passw	Jame	✓ OK		x					
Search Resu	ult - 1 device(s)										//

#### N

#### Note

- 1. The username and password are mandatory for the NPort 5000 installed with firmware v1.14 and above.
- 2. There will be session timeout after unlocking the NPort for 5 minutes. You will need to unlock the device again before further operation.

#### Search IP

You may also search for the NPort by specific IP address. Click **Search IP** in the toolbar and enter the IP address of the NPort.

_Int	out an IP address		
,			
	ļ		
		🗸 ОК	🗙 Cancel

### **Assign IP**

After locating a NPort, you may change its IP address if required.

1. Select the NPort that you would like to change to IP. You may perform the action to multiple units of the same model at once by holding CTRL and click the NPorts that you wish to change the IP.

Click Assign IP in the toolbar.

DSU 🖸							_	×
<u>F</u> ile F <u>u</u> r	nction <u>V</u> iew <u>H</u> elp							
<u>E</u> xit	🔮 🔮	≝ ⊑ IP Locate Cons	ole Assign IP Unte					
No	Model	LAN1 MAC Address	LAN1 IP Addr Assign IF	(Ctrl+I) AC Address	LAN2 IP Address	Status	Firmware Version	
<b>1</b>	NPort 5610-8-DT	00:90:E8:84:17:5C	192.168.127.242				Ver2.5	
<b>1</b> 2	NPort 5610-8-DT	00:90:E8:84:17:62	192.168.127.248				Ver2.5	

2. In most cases, the NPort requires a fixed IP address, select **Static IP address**. If you are not sure of your network environment, consult your network administrator.

lo	MAC Address	IP Address	Netmask	Gateway
	00:90:E8:84:17:5C	192.168.127.101	255.255.255.0	192.168.127.1
-	00:90:E8:84:17:62	192.168.127.248	255.255.255.0	192.168.127.1

 Click on the IP Address box to input the IP address manually. Do the same action to the Netmask cell as well. If multiple units of the same model are selected, click Assign IP Sequentially so it will assign IP in sequence, starting from the IP address of the first device.

<u>File</u> Fu	nction ⊻iew <u>H</u> elp							
<u>E</u> xit	🔮 😫 Search Search		nsole Assign IP Un-	Lock Import Exp				
No	Model	LAN1 MAC Address	LAN1 IP Addre /	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
<b>f</b> 1	NPort 5610-8-DT	00:90:E8:84:17:5C	192.168.127.101				Ver2.5	
	NPort 5610-8-DT	00:90:E8:84:17:62	192.168.127.102	-			Ver2.5	
<b>°</b> 2								
<b>°</b> 2								

#### Locate

**Locate** provides a way of finding the NPort's whereabout when in need. Select the NPort that you are trying to find then click **Locate** in the toolbar.

🔎 DSU								<u></u>	×
<u>F</u> ile F <u>u</u> n	iction <u>V</u> iew <u>H</u> elp								
<u> </u>	🔮 😫 Search Search	≝ ⊑ IP Locate Con		Un-Lock Impo	t E <u>xp</u> ort	🛃 Upgrade			
No	Model	LAN1 MAC A Locate S	erver 11 IP Addre	LAN2 MAC	ddress LA	N2 IP Address	Status	Firmware Version	
<b>f</b> 1	NPort 5610-8-DT	00:90:E8:84:17:5C	192.168.127.242					Ver2.5	
<b>°</b> 2	NPort 5610-8-DT	00:90:E8:84:17:62	192.168.127.248					Ver2.5	

If the NPort is equipped with a buzzer, after **Locate** is triggered, the NPort's buzzer will beep continuously until it is turned off.

Locate Device		×
Locating		
Model	NPort 5610-8-DT	
IP Address	192.168.127.101	
MAC Address	00:90:E8:84:17:5C	
Serial Number	5541	Stop

#### **Import Configuration**

The Import Configuration function is used to import an NPort configuration from a file into one or more of the same NPort model. To import a configuration, first select the target device, click **Import** in the toolbar, and then click on the **Browse** button to locate the configuration file and press **OK**.

Impo	ort File		$\times$
	Select Configuration File		
		Browse	
		🖉 DK 🛛 🗶 Cancel	

### NOTE

You can import the same configuration to multiple units of the same model.

For the overall NPort 5000 Series with a security enhanced firmware version, importing configuration decryption will be based on the pre-shared key defined in the NPort. If the pre-shared key does not match, you will see an error dialogue box on the screen.



You will then need to change the pre-shared key in **Console > Backup/Restore > Pre-shared Key** to match the encryption password of the configuration file before you can import.

For firmware versions supporting encrypted configuration files, refer to the table below.

Model Name	Firmware version supporting encrypted configuration files.
	NPort 5000 Series
NPort 5110	Firmware v2.6 and up with NPort Administration Suite v1.22 and up
NPort 5130, NPort 5150	Firmware v3.6 and up with NPort Administration Suite v1.22 and up
NPort 5200 Series	Firmware v2.8 and up with NPort Administration Suite v1.22 and up
NPort 5400 Series	Firmware v3.11 and up with NPort Administration Suite v1.22 and up
NPort 5600-8-DT Series	Firmware v2.4 and up with NPort Administration Suite v1.22 and up
NPort 5600-8-DTL Series	Firmware v1.3 and up with NPort Administration Suite v1.22 and up
NPort 5600 Series	Firmware v3.7 and up with NPort Administration Suite v1.22 and up
	NPort 5000A/IA5000A Series
NPort 5100A Series	Firmware v1.3 and up (Support with both web console and NPort
NPOIL STOOA Series	Administration Suite v1.22 or above)
NPort 5200A Series	Firmware v1.3 and up (Support with both web console and NPort
NPOIL S200A Series	Administration Suite v1.22 or above)
NPort 5x50AI-M12 Series	Firmware v1.2 and up (Support with both web console and NPort
INFOIL SXSUAL-MIZ Series	Administration Suite v1.22 or above)
NPort IA5150A, NPort	Firmware v1.3 and up (Support with both web console and NPort
IA5250A	Administration Suite v1.22 or above)
NPort IA5450A	Firmware v1.4 and up (Support with both web console and NPort
NFOIL INJ430A	Administration Suite v1.22 or above)

# NOTE

- You can simultaneously import the same configuration file into multiple NPort units of the same model. To select multiple NPort units, hold down the **Ctrl** key when selecting an additional NPort, or hold down the **Shift** key to select a block of NPort units.
- 2. If you have an encrypted configuration file, you will need to use the Device Search Utility V2.4 or above to import an encrypted configuration file.

# NOTE

If you do not remember the password of the encrypted configuration file, there is no alternative way to decrypt the file.

# **Export Configuration**

The Export Configuration function is a handy tool that can produce a text file that contains the current configuration of a particular NPort.

If you are using the NPort 5100 Series, NPort 5200 Series, or NPort IA5000 Series

For the overall NPort 5000 Series with security enhanced firmware version, export configuration encryption will be based on the Pre-shared key defined in the NPort (default is empty password, and you may configure the password in **Console > Backup/Restore > Pre-shared Key**. So when you are exporting the configuration file, you are only required to select the output file location. You may refer to page 96 for the security firmware version for your NPort.

# **Upgrade Firmware**

From time to time, Moxa would roll up new firmware for feature/security enhancement, patches, etc. It may be necessary to visit the NPort product website frequently to check for new firmware. You may also register to Moxa's website and follow the product updates so that you will be notified automatically for any recent activity. Check for **G. How to Become a Registered User of Moxa Website**.

- 1. Unlock the NPort you wish to upgrade, then click **Upgrade** function in the toolbar to start the process.
- 2. In the file picker, choose the firmware file for your NPort.
- 3. You will see the progress.

# NOTE

You can simultaneously upgrade the firmware of multiple NPort units that are of the same model. To select multiple NPort units, hold down the Ctrl key when selecting an additional NPort, or hold down the Shift key to select a block of NPort units.

#### Web Console

To change further settings NPort, click on the **Console** icon in the toolbar to launch the web console. This will take you to the web console where you can make all configuration changes.

DSU <u>F</u> ile F <u>u</u> nd	ction ⊻iew <u>H</u> elp						<u></u>	×
<u>Ē</u> . <u>E</u> xit	🔮 💁 Search Search	≝ ⊑ IP Locate <u>C</u> on	sole Assign IP Un-Lo	ock Import Exp	ort Upgrade			
No 🕗	Model	LAN1 MAC Address	Web Console (IPv4)	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
<b>₽</b> 1 <b>1111</b>	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254				Ver3.14 Build 21032913	

Refer to Chapter 2, Configuration by Web Console, for information on how to use the web console.

# Accessible IP

**Accessible IP** provides restriction of only listed IP can access the NPort. Select the specific NPort that you wish to set the access control and then right click and pick **Accessible IP**.

<u>E</u> xit	<u> </u>			sport Upgrade			
ło	Model	LAN1 MAC Address	LAN1 IP Addre / LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
2 2	NPort 5610-8-DT NPort 5610-8-DT	00:90:E8:84:17:5C 00:90:E8:84:17:62	192.1€       Search       Ctrl+B         192.1€       Search IP       Ctrl+S         Search IP       Ctrl+L       Locate (IPv4)         Console (IPv4)       Ctrl+C       Console (IPv4)         Console (IPv4)       Ctrl+C       Console (IPv5)         Console (IPv6)       Console (IPv6)       Console (IPv6)			Ver2.5 Ver2.5	
			Assign IP Ctrl+I     Un-Lock     Import     Export     Upgrade     Accessible IP				

Acc	ess Control Lis	st (ACL) / Accessibl	e IP Setting	×
	Model IP Address:	NPort 5610-8-DT 192.168.127.101	Enable the access	ible IP list
-	No IP Addre	ss Netmask	Rule	Add Rule
				Remove Rule
				Modify Rule
				Add This Host
				Remove All
				🗸 ок
				🗙 Cancel

**Enable the accessible IP list:** Turn on or off the Accessible IP function. **Add Rule:** To add an IP address that will be allowed to access the NPort.

DACL Rule		-	×
IP Address Netmask	192.168.1.100 F Enable	d	
	✓ OK X Cancel		

Enabled: To enable or disable this specific rule for the IP address

Remove Rule: To remove an established rule from the accessible IP list

Modify Rule: To adjust any established rule.

Add This Host: To add all your computer's available IP to the list.

Remove All: To remove all added IP addresses from the list.

Access Control Li	st (ACL) / /	Accessible IP Settir	ng	×
Model IP Address:	NPort 56 192.168.		nable the access	sible IP list
	.127.250 .127.200	Netmask 255, 255, 255, 255 255, 255, 255, 255 255, 255,	Rule Enabled Disabled Enabled	Add Rule Remove Rule Modify Rule Add This Host
¢			>	Remove All

# Standard Mode View/Simple Mode View

Simple Mode view summarizes how many NPorts and other Moxa devices are supported by DSU.

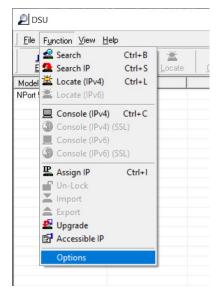
🔎 DSU							- 0	$\times$
<u>File</u> F <u>u</u> n	ction <u>V</u> iew <u>H</u> elp							
<u>.</u>	✓ Standard M	1ode 🛓 📃		r X 4	<u> </u>			
<u>E</u> xit	Simple Mo	de ate <u>C</u> on	sole <u>A</u> ssign IP <u>U</u> n-L	ock I <u>m</u> port E <u>x</u> p	ort U <u>p</u> grade			
No 🛆	Model	LAN1 MAC Address	LAN1 IP Address	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
🔒 1	NPort 5610-8-DT	00:90:E8:84:17:5C	192.168.127.101				Ver2.5	
2	NPort 5610-8-DT	00:90:E8:84:17:62	192.168.127.102				Ver2.5	
🔒 3	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254				Ver3.14 Build 21032913	

The list is defaulted and sorted by the model's name; you may sort by other fields by clicking the header.

DSU				85					<u> </u>	×
<u>File Function View</u>	Help									
<u> </u>	Search <u>I</u> P	Locate	Console Assign I	P <u>U</u> n-Lock	Limport	Export	<b>یک</b> Uggrade			
Model C	Count									
NPort 5610-8-DT 2 NPort 5430 V3 1	2									

# **Other Options**

There are few other options available for your to change to make **DSU** works better for your needs.



#### **General Settings - Search Properties**

Options				×
General S	Settings Search Items			1
	Search Properties			
	Retry count :	10		
	Timeout for each retry(ms):	1000		
			🗸 ОК	🗙 Cancel

**Retry count:** How many times does **DSU** retry to search for the devices in the LAN, 10 is the default. If your networking is slower to respond, you may increase the count.

**Timeout for each retry (ms):** The time interval between each retry. If your network environment has concerns for busy data traffic, you may increase the timer.

Options General Settings Search Items		×
De-selected Items Server Name LAN1 IP (V6) LAN2 IP (V6)	Selected Items       Model       LANT MAC Address       LANT INP Address       LANZ IPA Address       Status       Firmware Version       <	
Load Default		
	Cancel	

**Search items:** You may add or remove fields from the search result table to help with a better overview. Select the item in either pane and click the right or left arrow to switch side. Double arrows will move everything over. Items in **Selected Items** pane will be shown on the table header row, and the up and down red arrows are to adjust the display sequence.

# **Configuration by NPort Administrator Suite**



# ATTENTION

Before installing and configuring the NPort Administration suite, make sure your user privilege is set as system administrator.

NPort Administrator Suite is an integrated software suite that bundles NPort Administrator and the IP Serial Library, providing everything you need to manage, monitor, and change your NPort from a remote location.

With NPort Administrator, you can easily install and configure your NPort device server over the network. Five different functions are provided to ease the installation process: Configuration, Monitor, Porting Monitor, COM Mapping, and IP Address Report.

You may also use the other interface, like web console, Moxa CLI tool, serial console, or Telnet, to configure the device server. Refer to the specific section for additional information on using these consoles.

# **Installing NPort Administrator**

Download and run the setup program from Moxa's support website. Run NPort Administrator when the installation has been completed.

The Administrator-Configuration window is divided into four parts.

- The top section contains the function list and online help area. (Windows NT does not support this .chm file format.)
- The five Administrator function groups are listed in the left section.
- A list of NPort serial device servers, each of which can be selected to process user requirements, is displayed in the right section.
- The activity log, which displays messages that record the user's processing history, is shown in the bottom section.

👖 🔮 😫 Exit Search Search	P Locate	Configure W	eb							
Function	Configuration - 0 NPort(s)									
NPort	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status			
Configuration     Monitor					~					
					4					
unction					4					
roups↩				List-of	- <u>NPort</u>					
•										
	<						_			
									_	
sage Log · 0 Monitor Log									_	
Time		escription		€						
			Acti	vity∙Log						

# Searching for Device Servers Over a LAN

The **Search** function is used to locate all NPort 5000 device servers that are connected to the same LAN as your computer. Since the Search function broadcast searches by MAC address and not IP address, all NPorts connected to the LAN will be located, regardless of whether they are part of the same subnet as the host.

Exit Search Search	hIP Locate							
NPort     Configuration     Port     Orniguration     Port     Port     Port     Onnitor     COM Mapping     NP ddress Report	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status	
				dcast Search ify by IP Address				
			보 Loca 코 Unio 말 Cont	ck īgure				
			🗳 Upgr	grade Firmware				
	<			rt Configuration ort Configuration			_	
Message Log · 0 Monitor Lo			Assig	In IP Address				
No Time	1	Description			_			

In NPort Administrator, click **Search** to search your LAN for NPort device servers, or right-click to find **Search** function. When your unit appears in the search results, you may click **Stop** to end the search or wait a few more moments for the search to complete.

👖 🔮 💁 Exit Search Search	IP Locate	Configure We								
Function	Configuration - 1 NPort(s)									
Port     Configuration     Configuration     Port     Port     Port     Port     Port     Port     Monitor     Configuration     Conf	No /	Model NPort 5250A	MAC Address 00:90:E8:63:50:FD	IP Address 192,168,127,254	IP Address2	Server Name NP5250A_7162	Status Unlock			
Message Log - 9 Monitor Log No Time 5 3/21/2019 4-5 6 3/21/2019 4-5 7 3/21/2019 4-5 8 3/21/2019 4-5 9 3/21/2019 4-5	1:23 PM 4:28 PM 4:33 PM 7:07 PM	Found NPort(s): 1	5650-8-DT-J (00:90:E8:00 5250A (00:90:E8:63:50 Ff				_			

You may also search the NPort by specific IP address. Right-click and select **Search by IP address** and enter the IP address of the NPort.

The **Configuration** screen will list the NPort device servers that were found on the LAN. If your unit cannot be found, you may need to check your network environment. Check all cables and verify that your PC and device server are on the same LAN. If you still have problems, try connecting the device server directly to your PC.

# **Unlock Your NPort**

Before configuring the NPort, you will need to unlock the NPort first. Right-click the unit on the Configuration screen and select **Unlock** on the pop-up menu. Before configuring the NPort, you will need to unlock it first. Right-click the unit on the Configuration screen and select **Unlock** on the pop-up menu.

The default login is:

Username: **admin** Password: **moxa** 



#### ΝΟΤΕ

The NPort 5100/5200/IA5000 Series only requires a password.

Default password: moxa

The meanings of the six "Status" states are given below (note that the term Fixed is borrowed from the standard fixed IP address networking terminology):

#### Lock

The NPort is password protected, "Broadcast Search" was used to locate it, and the password has not yet been entered from within the current Administrator session.

#### Unlock

The NPort is password protected. "Broadcast Search" was used to locate it, and the password has been entered from within the current Administrator session. Henceforth, during this Administrator session, activating various utilities for this NPort will not require re-entering the server password.

#### Blank

The NPort is not password protected, and "Broadcast Search" was used to locate it.

#### Fixed

The NPort is not password protected, and "Search by IP address" was used to locate it.

#### Lock Fixed

The NPort is password protected, "Specify by IP address" was used to locate it, and the password has not yet been entered from within the current Administrator session.

#### Unlock Fixed

The NPort is password protected, "Specify by IP address" was used to locate it, and the password has been entered from within the current Administrator session. Henceforth, during this Administrator session, activating various utilities for this NPort will not require re-entering the server password.

## Configure

When NPort is in an unlocked state, right-click your unit in the Configuration screen and select **Configure** in the pop-up menu.

The progress bar shows that Administrator is retrieving configuration information from the specific NPort.

Exit Search Search Function	n IP Locate	Configure Wel		onfiguration -	1 NPort(s	)		
NPort	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status	
- Ca Monitor - Ca Monitor - C M Mapping - C IP Address Report	<	Spect     Spect     Sec     Spect     Sec     Spect     Spec	ck ïgure					
essage Log - 5 Monitor Log					_			 _
No         Time           3/27/2019 10:         3/27/2019 10:           9:         3/27/2019 11:           3/27/2019 11:         3/27/2019 11:	57:22 AM 57:43 AM 02:07 AM 02:07 AM	Unlock Fail: NPort §	Fail: NPort 52504 (00:9 52504 (00:90:E8:63:50: 2504 (00:90:E8:63:50:1	FD)	1			 _

The progress bar would appear, showing that Administrator is retrieving configuration information from the specific NPort.

Processing	×
Please wait	
9 / 46 , 19%	

## Basic

nformation	Account Management Configuration Pre-shared Key System Log Settings Auto Warning				
Model Name NPort 54501	Basic Network IP Address Report Serial Operating Mode Accessible IPs				
NPort 54501	Modify				
MAC Address 00:90:E8:9A:E0:BF	Server Name NP5450I_4850				
	V Modify				
Serial Number 4850	Time Zone (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London 💌				
4000	Local Date 4/17/2023				
Firmware Version					
Ver 3.14	Local Time 3:58:11 PM +				
1010.14	Time Server				
System Uptime	V Modify				
0 days, 00h:01m:00s	✓ Enable Web Console ✓ Enable HTTPS Console(TLS v1.2)				
	TLS v1.0/v1.1 for HTTPS console Enable Telnet Console				
	🔽 Enable Serial Console 📄 Reset Button Protect				
	Sensitive Data Encryption MD5/AES128				
	Modify				
	Maximun Login Users For Web Console 6 (1~6)				
	Auto Logout Setting 5 (1~1440min)				

In **Basic**, you can give your NPort an alias name, set the time zone, date, and time. Also you can define how your NPort can be accessed, refer to 3. Cybersecurity Considerations for security suggestions from Moxa.

## NOTE

The NPort 5100/5100A does not support **Time Setting** and **Sensitive Data Encryption**.

Parameter	Setting	Factory Default	Description	Necessity
Server name	1 to 39 characters	NP[model name]_[Serial No.]	This option is useful for specifying the location or application of different NPorts.	Optional
Time zone	User selectable time zone Not available in NPort 5100/5100A/5200/5200A Series	GMT (Greenwich Mean Time)	N/A	Required
Local time	User adjustable time (1900/1/1-2037/12/31) Not available in NPort 5100/5100A Series	GMT (Greenwich Mean Time)	Click the <b>Modify</b> button to open the Modify time settings window to input the correct local time.	Required
Time server	IP or Domain address (only available in 2/4/8/16 ports models) E.g., 192.168.1.1 or time.stdtime.gov.tw or time.nist.gov	None	NPorts use SNTP (RFC-1769) for auto time calibration. Input the correct <b>Time server</b> IP address or domain name. Once the NPort is configured with the correct Time server address, the NPort will request time information from the Time server every 10 minutes.	Optional
Daylight saving	Setting 1: "Start Date: Month, Week, Day, Hour" Setting 2: "End Date: Month, Week, Day, Hour" Setting 3: "Offset: hours"	None	The NPort can offset the system time to the values you have set in these settings. (This feature only applies to the NPort 5000AI-M12 Series.)	
http console	Enable or Disable	Disable	The options that are disabled by	Required
https console	Enable or Disable	Enable	default-http Console, Telnet	Required

Parameter	Setting	Factory Default	Description	Necessity
TLS v1.0/v1.1 for HTTPS console	Enable or Disable	Disable	Console, and Serial Console—are for security reasons. In some cases, disable one or most of	Required
Telnet console	Enable or Disable	Disable	these console utilities as an extra	Required
Serial Consoles	Enable or Disable	Enable	precaution to prevent unauthorized users from accessing	Required
Moxa Service	Enable or Disable	Enable	your NPort. Refer to <b>Chapter 3</b> "Cybersecurity Considerations" for detailed suggestions.	Required
Beep Service	Enable or Disable	Enable	Beeper Service is to provide audio notification and warning according to the different situations. (This feature only applies to the NPort 5000AI-M12 Series.)	Optional
Reset button protection	No or Yes	No	Select the <b>Yes</b> option to allow limited use of the reset button. In this case, the reset button can be used for only 60 seconds; 60 s. after booting up, the Reset Button will be disabled automatically.	Required
LCM read-only protection	Writeable/Read-only	Writeable	The NPort 5000 front panel, known as the LCM (Liquid Crystal Module), may be configured for read-only or writeable access. Read-only access allows settings to be viewed but not changed. Writeable access allows users in the Administration group to change the setting. This setting is only available for the model that has a font panel.	Optional



## WARNING

If you disable all the console and services, there is no alternative way to access the NPort device servers neither locally nor remotely. The only way to gain control is to reset to factory default settings.

## Network

You must assign a valid and unique IP address to the NPort before it will work in your network environment, otherwise, the NPort will not have a valid connection to the network. Your network system administrator should provide you with an IP address and related settings for your network. Select the **Modify** checkbox for items for editing.

You can choose from four possible **IP configuration** modes—Static, DHCP, DHCP/BOOTP, and BOOTP—located under the web console screen's IP configuration dropdown box.

formation	Account Management Configuration Pre-shared Key System Log Settings Auto Warnin
Model Name NPort 54501	Basic Network IP Address Report Serial Operating Mode Accessible IF
MAC Address 00:90:E8:9A:E0:BF	Network Setting SNMP Setting
Serial Number 4850	IP Address 192.168.127.254 Netmask 255.255.0
Firmware Version Ver 3.14	IP Configuration Static  Gateway
System Uptime 0 days, 00h:01m:00s	DNS Server 1
	IV Modify IV Enable LLDP
	Message Transmit Interval 30 (5~32768sec)

Method	Function Definition
Static	The user must define the IP address, Netmask, and Gateway.
DHCP	The DHCP Server assigns the IP address, Netmask, Gateway, DNS, and Time Server
DHCP/BOOTP	The DHCP Server assigns the IP address, Netmask, Gateway, DNS, and Time Server, or
DHCP/BOOTP	the BOOTP Server assigns the IP address (if the DHCP Server does not respond).
BOOTP	The BOOTP Server assigns the IP address.

### **Network Settings**

Parameter	Setting	Factory Default	Description	Necessity
IP Address	E.g., 192.168.1.1	192.168.127.2 54	An IP address is a number assigned to a network device (such as a computer) as a permanent address on the network. Computers use the IP address to identify and talk to each other over the network. Choose a proper IP address that is unique and valid in your network environment.	Required
Netmask	E.g., 255.255.255.0	255.255.255.0	A subnet mask represents all the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the NPort will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on the local network segment. If the address is on the same network segment as the NPort, a connection is established directly from the NPort. Otherwise, the connection is established through the given default gateway.	Required

Parameter	Setting	Factory Default	Description	Necessity
Gateway	E.g., 192.168.1.1	None	A gateway is a network gateway that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. The NPort needs to know the IP address of the default gateway computer to communicate with the hosts outside the local network environment. For correct gateway IP address information, consult with your network administrator.	Optional
IP Configuration	Static DHCP DHCP/BOOTP BOOTP	Static	N/A	Required
Multi-LAN mode (for the NPort IA5000A Series only)	Switch Redundant LAN Dual IP	Switch	Dual LAN can be used as a redundant connection or dual IP. The scenario for redundancy is the NPort will automatically switch to working connection in case the other one loses connectivity (because of failed network component in the NPort, port at the switch/router stop working, etc.). As for dual IP scenario, each port will have its own IP address, but both will have the same MAC address, as it is convenient to connect the NPort to different network.	Optional
DNS server 1/ DNS server 2	E.g., 192.168.1.1	None	To use the NPort's DNS feature, you need to configure the DNS server. Doing so allows the NPort to use a host's domain name to access the host. The NPort provides DNS server 1 and DNS server 2 configuration items to configure the IP address of the DNS server. DNS Server 2 is included for use when DNS server 1 is unavailable. The NPort plays the role of DNS client, in the sense that the NPort will actively query the DNS server for the IP address associated with a particular domain name.	Optional
LLDP Settings	Enable or Disable	Enable	Not available for the NPort 5600DT Rev 1.5 or earlier	Optional



## WARNING

In Dynamic IP environments, the firmware will retry three times every 30 seconds until network settings are assigned by the DHCP or BOOTP server. The Timeout for each try increases from 1 second, to 3 seconds, to 5 seconds.

If the DHCP/BOOTP Server is unavailable, the firmware will use the default IP address (192.168.127.254), Netmask, and Gateway for IP settings.

## **SNMP Settings**

Configuration		×
Information Model Name NPort 54501 MAC Address 00:90:E8:9A:E0:BF Serial Number 4850		uration Pre-shared Key   System Log Settings   Auto Warning   tress Report   Serial   Operating Mode   Accessible IPs   ng
Firmware Version Ver 3.14 System Uptime 0 days, 00h:01m:00s	Contact Name Location SNMP agent version	  ▼ ∨1  ▼ ∨2

Parameter	Setting	Factory Default	Description	Necessity
Community Name	1 to 31 characters (e.g., Moxa)	Public	A community name is a plain-text password mechanism that is used to weakly authenticate queries to agents of managed network devices.	Optional
Contact	1 to 31 characters (e.g., Support, 886- 89191230 #300)	None	The SNMP contact information usually includes an emergency contact name and telephone or pager number.	Optional
Location	1 to 39 characters (E.g., floor 1, office 2)	None	Specify the location string for SNMP agents, such as the NPort. This string is usually set to the street address where the NPort is physically located.	Optional
SNMP Agent Version V1, V2, V3	V1, V2, V3 (V3 is available on 4/8/16 ports model)	V1, V2 checked for 1/2-port models. V1, V2, V3 checked for 4/8/16-port models	The NPort 5000 1- and 2-port model supports SNMP V1 and V2, where the 4/8/16-port model supports V1, V2 and V3. Select the version according to your environmental needs. Note that the 4/8/16-port model only supports standard MIB such as RFC1213/1317, which supports Set server name, contact, location, whereas the 1/2-port model only supports Get, but not Set.	Optional

The following fields allow you to define usernames, passwords, and authentication parameters for two levels of access: read-only and read/write. The name of the field will show which level of access it refers to. For example, Read-only authentication mode allows you to configure the authentication mode for read-only access, whereas Read/write authentication mode allows you to configure the authentication mode for read/write access. For each level of access, you may configure the following:

,				
Read-only username	1 to 31 characters	None	Use this optional field to identify the username for the specified level of access.	Optional
Read-only authentication mode	MD5, SHA	Disable	Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication	Optional
Read-only password	1 to 31 characters		Use this field to set the password for read only of access.	Optional
Read-only privacy mode	DEC, CBC	Disable	Use this field to enable or disable DES_CBC data encryption for the specified level of access.	Optional
Read-only privacy	1 to 31 characters	None	Use this field to define the encryption key for the specified level of access.	Optional
<i>Read/write username</i>	1 to 31 characters	None	Use this optional field to identify the username for the specified level of access.	Optional

Parameter	Setting	Factory Default	Description	Necessity
<i>Read/write authentication mode</i>	MD5, SHA	Disable	Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication	Optional
Read/write only password	1 to 31 characters		Use this field to set the password for read/write access.	Optional
Read/write only privacy mode	DEC, CBC	Disable	Use this field to enable or disable DES_CBC data encryption for the specified level of access.	Optional
Read/write only privacy	1 to 31 characters	None	Use this field to define the encryption key for the specified level of access	Optional

## **IP Address Report**

When NPort products are used in a dynamic IP environment, users must spend more time on IP management tasks. For example, if the NPort works as a server (TCP or UDP), then the host, which acts as a client, must know the IP address of the server. If the DHCP server assigns a new IP address to the NPort, the host must have some way of determining the NPort's new IP address.

NPort products help by reporting their IP address periodically to the IP location server, in case the dynamic IP has changed. The parameters shown below are used to configure the Auto IP report function. There are two ways to develop an "Auto IP report Server" to receive NPort's Auto IP report.

nent Configuration Pre-shared Key System Log Settings Auto Warning ork IP Address Report Serial Operating Mode Accessible IPs
То
t To UDP Port 4002
Period 10 (0-99 sec)
fy" check box to modify configuration
fy''

- 1. Use Device Server Administrator's **IP Address Report** function.
- 2. Auto IP report protocol, which can receive the Auto IP report automatically regularly, is also available to help you develop your own software. Refer to **Appendix E** for details about the **Auto IP report** protocol.

Parameter	Setting	Factory Default	Description	Necessity
Auto report to IP	E.g., 192.168.1.1 or URL	None	Reports generated by the Auto report function will be automatically sent to this IP address. In the multiple-LAN model version, two IPs can be set for Auto report. The report will be sent to each IP when generated.	Optional
Auto report to UDP port	E.g., 4001	4002	In the multiple-LAN model version, two IPs can be set for Auto report. Report will be sent to each IP when generated.	Optional

Parameter	Setting	Factory Default	Description	Necessity
Auto report period	Time interval (in seconds)	10	NA	Optional

## Serial

The **Serial** tab is where you set the serial communication parameters for each device port. Settings include baudrate, parity, and flow control. Each device port can be configured independently.

formation Model Name NPort 54501	Acco Basic	unt Manage ;   Neti			.og Settings   Auto Warnin ting Mode   Accessible IF
MAC Address 00:90:E8:9A:E0:BF		Port	lodify -	Settings	
Serial Number 4850		1 2 3 4	Allas	115200,N,8,1,RTS/CTS 115200,N,8,1,RTS/CTS 115200,N,8,1,RTS/CTS 115200,N,8,1,RTS/CTS 115200,N,8,1,RTS/CTS	
Firmware Version Ver 3.14					
System Uptime 0 days, 00h:01m:00s					
		1		View Settings	Settings

Click **Modify** and select the port(s) that you would like to edit settings then click **Settings** for editing.

Apply port	alias to all selected	ports.		
Port Alias				
Baud Rate	115200	▼ Flow C	ontrol RT	s/cts •
Parity	None	✓ FIFO	En	able 🔻
Data Bits	8		e RS	-232
Stop Bits	1			

Parameter	Setting	Factory Default	Description	Necessity
Port Alias	1 to 15 characters (E.g., PLC-No.1)	None	Port Alias is specially designed to allow easy identification of the serial devices that are connected to the NPort's serial port.	Optional

Parameter	Setting	Factory Default	Description	Necessity
Baud rate	Support standard baudrates (bps): 50/ 75/ 110/ 134/ 150/ 300/ 600/ 1200 1800/ 2400/ 4800/ 7200/ 9600/ 19200/ 38400/ 57600/ 115200/ 230.4k/ 460.8k/ 921.6k * The NPort 5110/5210/ 5230/5232I Series, and IA 5000 Series are as low as 110 bps, and	115200 bps	The rate of data transmission to and from the attached serial device.	Required
Data bits	up to 230.4 kbps 5, 6, 7, 8	8	When data bits is set to 5 bits, the stop bits setting will automatically change to 1.5 bits.	Required
Stop bits	1, 1.5, 2	1	The size of the stop character.	Required
Parity	None, Even, Odd, Space, Mark	None	Even and Odd parity provides rudimentary error-checking; Space and Mark parity are rarely used.	Required
Flow control	None, RTS/CTS, DTR/DSR, Xon/Xoff	RTS/CTS	The method used to suspend and resume data transmission to ensure that data is not lost. If you can use it, <b>RTS/CTS</b> (hardware) flow control is recommended.	Required
FIFO	Enable, Disable	Enable	Controls whether the device port's built- in 128-byte FIFO buffer is used. When enabled, the FIFO helps reduce data loss regardless of direction.	Required
Interface*	RS-232 RS-422 2-wire RS-485 4-wire RS-485	RS-232	The serial interface that will be used. The options that are available depend on the specific model of the device server.	Required

\*Supported interfaces vary by model. Refer to the datasheet of your NPort device to see which serial interface it supports.

## **Operation Mode**

This section covers configuration of a device port's operation mode. The operation mode determines how the device port will interact with the network. Which operation mode you select will depend on your specific application. Refer to the chart at the end of this section for guidance on selecting the most appropriate operation mode. For additional information on each operation mode, refer to **Chapter 4** and **Chapter 5**.

## **Adjusting Operation Mode Settings**

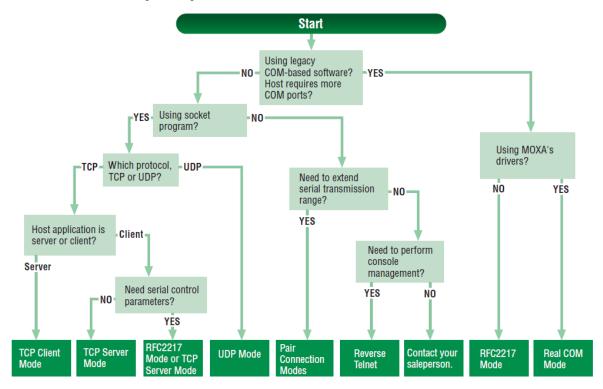
The operation mode parameters for each device port can be configured through NPort Administrator. Open your device server's configuration window using the same method you used to adjust the network parameters. On the **Operating Mode** screen, select the **Modify** checkbox and then select the device port you wish to configure. Click **Settings** to configure the selected device port.

I r	Port	Alias	OP Mode	_
	1 2		Real COM Mode Real COM Mode	
	2		Theat COM Mode	
				-

Set the operating mode and associated parameters as needed. Refer to **Chapter 4** and **Chapter 5** for additional information on operating modes and advanced settings. When you are ready to restart the device server with the new settings, click **OK**.

1 Port(s) Selected. 1st p	port is Port 1			
Operating Mode	Real COM Mode	-		
Real COM				
Max. Connection	1	Ŧ		
Misc (Optional)				
TCP Alive Check	Timeout (0-99 min)			
Allow Driver C	ontrol			
🔲 Ignore Jamme	dIP			
Data Packing (Opti	onal)			
🔲 Delimiter 1	00 (0-ff, Hex)	Force Tx Timeout	0	(0-65535 ms)
		Decking Longth	-	
🗖 Delimiter 2	00 (0-ff, Hex)	Packing Length	0	(0-1024 bytes)

### How to Choose Proper Operation Mode



## **Accessible IP Settings**

**Accessible IP Settings** allow you to add or block remote host IP addresses to prevent unauthorized access. Access to the NPort is controlled by an IP address. That is, if a host's IP address is in the accessible IP table, then the host will be allowed to access the NPort. Three setting types are described below:

nformation	Account Managem	ent Configuration	Pre-shared Key   Syst	em Log Settings	Auto Warning
Model Name NPort 54501	Basic Netwo	ork   IP Address F	leport Serial 0	perating Mode	Accessible IPs
MAC Address 00:90:E8:9A:E0:BF			allowed for the IPs NOT (		
Serial Number	All d	evice service are NO	Restrictions Tallowed for the IPs NOT	on the list)	
4850	No	IP Address	Netmask		^
1999 - 1997 - 199	☑ 1	192.168.1.0	255.255.255.0		
Firmware Version	2				
Ver 3.14	3				
	4				
System Uptime					
0 days, 00h:20m:53s					
				Setting	
				<b>;</b>	

#### • Activate the Accessible IP list

Operation modes are NOT allowed for IPs NOT on the list. IPs that are not on the list will not be granted when communicating with NPort via Operation Mode.

Apply additional restrictions

All device services are NOT allowed for IPs NOT on the list. Services will not be granted for IPs that are not on the list. Note that all IPs will still have access if the IP list is empty, even though the function is enabled.

Tip: For exact IP identification, the netmask needs to be 255.255.255.255.

- Only one host with a specific IP address can access the NPort Enter "[IP address]/255.255.255.255" (e.g., "192.168.1.1/255.255.255.255").
- Hosts on a specific subnet can access the NPort Enter "[IP address]/255.255.255.0" (e.g., "192.168.1.0/255.255.255.0").

#### • Any host can access the NPort

Disable this function. Refer to the following table for more details about the configuration.

Allowable Hosts	Input format
Any host	Disable
192.168.1.120	192.168.1.120 / 255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0 / 255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0 / 255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0 / 255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128 / 255.255.255.128

## **Account Management**

The Account Management setting provides administrators the authority to add/delete/modify a user account, grant access to the device users for specified function groups, and manage password and login policy to ensure device is used by a proper set of people.

Configuration	×
Information Model Name NPort 54501 MAC Address 00:30:E8:34:E0:BF Serial Number 4850	Basic       Network       IP Address Report       Serial       Operating Mode       Accessible IPs         Account Management       Configuration Pre-shared Key       System Log Settings       Auto Warning         Notification Message       User Account       Password and Login Policy       Image: Configuration Pre-shared Key       System Log Settings       Auto Warning         Image: Configuration Message       User Account       Password and Login Policy       Image: Configuration Policy         Image: Configuration Message       Image: Configuration Policy       Image: Configuration Policy       Image: Configuration Policy
Firmware Version Ver 3.14 System Uptime 0 days, 00h:20m:53s	Please contact administrators if you forget the password. Authentication Failure Message
	Click the "Modify" check box to modify configuration

## **Notification Message**

As an administrator, you may customize your **Login Message** and the **Login Authentication Failure Message** to notify users with information you would like to provide.

Configuration		>
Information Model Name NPort 5450I	Account Management Co	Address Report   Serial   Operating Mode   Accessible IPs nfiguration Pre-shared Key   System Log Settings   Auto Warning er Account   Password and Login Policy
MAC Address 00:90:E8:9A:E0:BF	Modify —	Welcome to NPort
Serial Number 4850	Login Message	
Firmware Version Ver 3.14		
System Uptime 0 days, 00h:20m:53s	Login	Please contact administrators if you forget the password.
	Authentication Failure Message	

The message will appear on the login page at the time of a successful login or login failure. Examples are below.

ΜΟΧΛ	Total Solution for Industrial Device Networking	www.moxa.com
	Usemame: Password: Login	
ΜΟΧΛ	Total Solution for Industrial Device Networking	
		WWW.moxa.com
		www.moxa.com
	Usemame: Password: Login	www.moxa.com

## **User Account**

In the NPort 5000 Series, the main function groups are highly correlated with the **User Level** set by the administrator(s). Administrators are allowed to add user accounts to the NPort 5000 device by clicking the **Add** button on the **User Account** page. You may also click on the current user to **Edit** or Delete the selected account.

Information Model Name NPort 5450I	Basic	Network	IP Address Re		erating Mode 📔 Accessible IPs
	Account N	fanagement	Configuration	Pre-shared Key 📔 Syster	n Log Settings 📔 Auto Warning
	Notific	ation Message	User Account	Password and Login Polic	9
MAC Address 00:90:E8:9A:E0:BF		Modify		-	
		Index	Active	Account Name	User Level
Serial Number		1	V	admin	Read Write
4850		2	V	guest	Read Only
		3			
Firmware Version		4			
Ver 3.14		6			
		-			
Custom Hating					
System Uptime 0 days, 00h:20m:53s					
0 days, oon.20m.33s					
		<			>
				(******	dit Delete
				<u>i</u>	

The **Add Account (Edit Account)** page will show up for you to enter (modify) account information and assign password to this user. Also, the Administrator(s) may assign proper **User Level** to this user to limit his/her privileges of using the NPort 5000.

🐝 User Account Setting		_		$\times$
USER 3				
Active				
Account Name				
User Level	Read Write		•	
Change Pass	word ——			
Password				
Confirm Passwor	d			
	🗸 ок	×	Cancel	

## **Password and Login Policy**

A user with an administrator role is authorized to determine the password and login policy of the NPort 5000 device.

nformation Model Name	Basic Network IP Address Report Serial Operating Mode Accessible IP
NPort 5450I	Account Management Configuration Pre-shared Key System Log Settings Auto Warnin
	Notification Message User Account Password and Login Policy
MAC Address 00:90:E8:9A:E0:BF	☐ ✓ Modify
Serial Number	Password Minimun Length 4 (4-16)
4850	Password Lifetime 0 (0-180 days, 0 for disable)
Firmware Version	Enable Password Complexity Strength Check     Enable Password Complexity Strength Check
Ver 3.14	Enable At Least One Digit (0-9)     Enable Mixed Upprt And Lower Case Letters (A-Z, a-z)
System Uptime 0 days, 00h:20m:53s	Enable At Least One Special Character ("1@#\$%",⇔][0())
	Modify
	Retry failure threshold 5 (1-10retry)
	Lockout Timeout 5 (1-60min)

## Account Password Policy

Parameter	Setting	Default	Description
Password minimum length	4-16 characters	4	Define the minimum length of the login password
Password complexity strength check:	Enable/Disable	Disable	Enable password complexity strength check will enforce the password combination setting
• At least one digit (0-9)	Enable/Disable	Disable	The password must contain at least one number (0-9) when enabling this parameter
<ul> <li>Mixed upper and lower case letters (A to Z, a to z)</li> </ul>	Enable/Disable	Disable	The password must contain an upper and a lowercase letter when enabling this parameter
<ul> <li>At least one special characters (~!@#\$%^&amp;*- _ ;:,.&lt;&gt;[]{}())</li> </ul>	Enable/Disable	Disable	The password must contain at least one special character when enabling this parameter
Password lifetime	0-180 days (0 for disable)	90 days	A password lifetime can be specified, and a system notification message will show up to remind users to change the password if the option is enabled.

## **Account Login Failure Lockout**

Parameter	Setting	Default	Description
Account Login Failure Lockout	Enable/Dicable	ll)icahle	An account login failure lockout rule can be
Account Login Failure Lockout	Enable/Disable		defined and enforced when enabled.
Detro fellowe three sheld	1-10 retry	5 if	Number of retries can be determined prior to the
Retry failure threshold		enabled	lockout
	1.00 main $u$ to $(a)$	5 if	Lockout duration can be specified to determine
Lockout time	1-60 minute(s)	enabled	time until the next retry.

## **Configuration Pre-shared Key**

For the overall NPort 5000 Series with a security enhanced firmware version, importing configuration decryption will be based on the pre-shared key defined in the NPort. If the pre-shared key does not match, you will see an error dialogue box on the screen.

Information Basic Network IP Address Report Serial Operating Mode Accessible IPs	Configuration	×
Model Name NPort 5450l     Account Management     Configuration Pre-shared Key     System Log Settings     Auto Warning       MAC Address 00:90:E8:9A:E0:BF     Image: Chiper Key For Encrypting The Configuration File:       Serial Number 4850     Firmware Version     Image: Chiper Key For Encrypting The Configuration File:     Image: Chiper Key For Encrypting The Configuration File:	Model Name NPort 54501 MAC Address 00:90:E8:3A:E0:BF Serial Number 4850	Account Management Configuration Pre-shared Key System Log Settings Auto Warning

## System Log Settings

System Log Settings allow NPort users to customize network events that are logged by the NPort 5000. Events are grouped into four categories, known as event groups, and the user selects which groups to log as Local Log (on the NPort 5000). The actual system events that would be logged for each system group are listed under the column "Summary". For example, if **System** was enabled, then System Cold Start events and System Warm Start events would be logged.



## ΝΟΤΕ

- The NPort 5100, NPort 5200, and NPort IA5000 Series don't support this function.
- Remote Log does not apply to the NPort 5000 Series.

onfiguration				×
Information Model Name NPort 54501	Basic Netv Account Manage		s Report Serial Operating Mode Accessible IPs ion Pre-shared Key System Log Settings Auto Warning	
MAC Address 00:90:E8:9A:E0:BF		ocal Log Remote Lo	ng Summary	
Serial Number 4850	System		System Cold Start, System Warn Start	
Firmware Version Ver 3.14	Network		DHCP/800TP Get IP/Renew, NTP, Mail Fail, NTP Connect Fail, IP Conflict, Network Link Up, Network Link Down	
System Uptime 0 days, 00h:20m:53s	Config		Login Fail, IP Changed, Passwrod Changed, Config Change, Firmware Upgrade, Firmware, Config Import, Config Export	
	OpMode		Connect, Disconnect	
	SYSLOG se	rver		
	SYSLOG fac	cility local use (	J _	
	SYSLOG se	verity Emergenc	y 🔽	
	Click the "Moo	dify" check box to mo	odify configuration	cel
ocal Log	Keer	o the log in tl	he flash of NPort 5000 up to 512 items.	
ystem	I			
stem Cold Start	NPoi	rt 5000 cold :	start.	
ystem Warm Start	NPor	rt 5000 warm	n start.	

### Network

DHCP/BOOTP/PPPoE Get IP/Renew	IP of the NPort 5000 is refreshed.
NTP	Time synchronization successful.
NTP Connect Fail	The NPort 5000 failed to connect to the NTP Server.
Mail Fail	Failed to deliver the email.
IP Conflict	There is an IP conflict on the local network.
Network Link Down	LAN 1 Link is down.

### Config

Static IP address was changed.
Administrator Password was changed.
The NPort 5000's configuration was changed.
Firmware was upgraded.
SSL Certificate was imported.
Config was imported.
Config was exported.

#### OpMode

Connect	Op Mode is in use
Connect	Op Mode is in use
Disconnect	Op Mode switched from in use to disconnect.
Authentication Fail	The Authentication failed in terminal; reverse terminal; or dial in/out operation
Authentication Fail	modes
Restart	Serial port restarted.

## **Auto Warning Settings**

The NPort device server can automatically warn administrators of certain system, network, and configuration events. Depending on the event, different options for automatic notification are available. These options are configured in the Auto Warning Settings.

## **Email and SNMP trap**

The Email and SNMP trap parameters are used to configure how email and SNMP traps are sent when an automatic warning is issued by the NPort device server.

Configuration		×
Information Model Name NPort 54501	Account Management Config	ress Report Serial Operating Mode Accessible IPs uration Pre-shared Key System Log Settings Auto Warning
MAC Address 00:90:E8:9A:E0:BF	E-Mail and SNMP Trap Settings	Event Port Event System Log Capacity
Serial Number 4850	From E-Mail Address: To E-Mail Address 1: To E-Mail Address 2:	NP5450I_4850@NP5450I
Firmware Version Ver 3.14	To E-Mail Address 2: To E-Mail Address 3: To E-Mail Address 4:	
System Uptime 0 days, 00h:05m:49s	Modify Mail Server Authenticati	on Setup
	Trap Server Trap Version	v1 •
	Trap Community	
	Click the "Modify" check box to	o modify configuration

### **Mail Server**

Parameter Setting		Factory Default	Description	Necessity
Mail server	IP or Domain Name	None	This optional field is for the IP address or domain name of your network mail server, if applicable. A mail server is required for the NPort to send email warnings about administrative events.	Optional
Username	1 to 15 characters	None	This optional field is used if your mail server requires it.	Optional
Password 1 to 15 characters		None	This optional field is used if your mail server requires it.	Optional
From email address	1 to 63 characters	None	This optional field sets the "from" email address that will show up in an automatic warning email.	Optional
Email address1 to 631/2/3/4characters		None	These optional fields set the "destination" email address for automatic email warnings.	Optional

### **SNMP Trap Server**

Parameter	Setting	Factory Default	Description	Necessity
SNMP trap server IP or domain name	IP address or Domain Name	None	Selecting the version based on your environmental needs. We strongly suggest to that you change the community name from the default <b>public</b> to another name; it is for security prevention reasons.	Optional



## ATTENTION

Consult your network administrator or ISP for the proper mail server settings. The **Auto warning** function may not work properly if it is not configured correctly. NPort SMTP AUTH supports LOGIN, PLAIN, CRAM-MD5 (RFC 2554).

### Event

The Email and SNMP trap parameters are used to configure how email and SNMP traps are sent when an automatic warning is issued by the NPort device server.

nformation Model Name NPort 54501		ress Report   Iration Pre-shared	Serial Operating Mo Key System Log Sett	
	E-Mail and SNMP Trap Settings	Event Port E	vent   System Log Capacit	ע]
MAC Address 00:90:E8:9A:E0:BF	Modify	Mail	Тгар	
Serial Number 4850	Cold Start	Γ		
4030	Warm Start	Γ	Γ	
Firmware Version Ver 3.14	Authentication Failure			
Ver 3.14	IP Address Changed	Γ		
System Uptime 0 days, 00h:05m:49s	Password Changed	Γ		
1777) 1				

The Event Type parameters are used to configure which events will generate an automatic warning from the NPort device server, and how that warning will be issued. For each listed event, certain automatic warning options are available. If Mail is selected, an email will be sent. If Trap is selected, an SNMP trap will be sent. The **Relay Output** option is available for the NPort IA5000/IA5000A Series.

#### Cold start

Refers to starting the system from power off (contrast this with warm start). When performing a cold start, the NPort will automatically issue an auto warning message by email or send an SNMP trap after booting up.

#### Warm start

A warm start refers to restarting the computer without turning the power off. When performing a warm start, the NPort will automatically send an email, or send an SNMP trap after rebooting.

#### Authentication failure

An authentication failure event is triggered when the user inputs an incorrect password from the Console or Administrator. When an authentication failure occurs, the NPort will immediately send an email or SNMP trap.

#### IP address changed

An IP address changed event is triggered when the user has changed the NPort's IP address. When the IP address changes, the NPort will send an email with the new IP address before the NPort reboots. If the NPort cannot send an email message to the mail server within 15 seconds, the NPort will reboot anyway, and abort the email auto warning.

#### Password changed

A password changed event is triggered when the user has changed the NPort's password. When the password changes, the NPort will send an email with the password changed notice before the NPort reboots. If the NPort cannot send an email message to the mail server within 15 seconds, the NPort will reboot anyway, and abort the email auto warning.

#### Power failure (this event type only applies to NPort IA5000/IA5000A Series)

The NPort IA5000/IA5000A Series has two DC power inputs for redundancy. Different approaches are used to warn engineers automatically, including by email and by relay output. The relay output will be canceled after the power recovers, or by selecting "acknowledge event" using the web console or Telnet. When the Relay Output is sending a warning, the Ready LED will flash red until the warning event ceases.

## **Port Event**

Port event helps you with monitoring the serial communication status and changes. Here we provide two events of monitoring: **DCD changed** and **DSR changed**.

First, click **Modify** select the serial port you would like to monitor and click **Settings** below:

nformation	Basic	Network	IP Address F	Report Serial	Operating Mode	Accessible IPs
Model Name NPort 54501	Account	anagement	Configuratio	n Pre-shared Key   S	ystem Log Settings	Auto Warning
NF0I( 3430)	E-Mail	and SNMP Tr	ap Settings   Ev	ent Port Event Syste	m Log Capacity	
MAC Address			4	1.2		
00:90:E8:9A:E0:BF		Modify				
Serial Number		Port	Alias	DSR Changed	DCD Changed	
4850		1				
		3				
Firmware Version		4				
Ver 3.14						
System Uptime						
0 days, 00h:19m:31s						
		<			>	
					Setting	
						-

#### Port Alert option appears:

Port	t Alert			×
	1 Port(s) Selected. 1	st port is Port 1		
		Mail	Тгар	
	DSR Changed			
	DCD Changed			
		🗸 ОК	×	ancel

#### DCD changed

A DCD (Data Carrier Detect) signal change shows that the modem connection status has changed. For example, a DCD change too high shows that the local modem and remote modem are connected. A DCD signal change to low shows that the connection line is down. When the DCD changes, the NPort will immediately send an email, send an SNMP trap, or trigger the relay output\*.

#### DSR changed

A DSR (Data Set Ready) signal change shows that the data communication equipment's power is off. For example, a DSR change to high indicates that the DCE is powered ON. A DSR signal changes to low indicates that the DCE is powered off. When the DSR changes, the NPort will immediately send an email, send an SNMP trap, or trigger the relay output\*.

\*Relay output is only supported by the NPort IA5000/IA5000A Series.

## NOTE

*Relay Output* is only available for the NPort IA5000/IA5000A Series. Users can connect to **Monitor** > **Relay Output** from the web console to check which event is causing the warning. The relay output will be canceled if the abnormal state is restored, or if **Acknowledge Event** is selected from the web or Telnet console. When the Relay Output is issuing a warning, the Ready LED will flash red until the warning event ceases.

Parameter	Setting	Factory Default	2 Description			
Mail	Enable, Disable Disable Disable Disable Correctly and the the NPort sends email to pre-defined email boxes when the enabled events (Cold start, Warm start, Authentication failure, et occur. To configure this feature, click the		email boxes when the enabled events (Cold start, Warm start, Authentication failure, etc.)	Optional		
Trap	Enable, Disable	Disable	This feature helps the administrator manage how the NPort IA5000A sends an SNMP Trap to a pre-defined SNMP Trap server when the enabled events (Cold start, Warm start, Authentication failure, etc.) occur. To configure this feature, click the <b>Event Type</b> <b>Trap</b> checkbox.	Optional		



## ATTENTION

**DCD** and **DSR** signal changes only apply to the RS-232 interface.

## System Log Capacity

You can decide how to store your log data and if you need to be informed when the storing capacity is nearing a certain percentage and how if log data can be overwritten or kept if the storage is full.

nformation Model Name	Basic Network IP Address Report Serial Operating Mode Accessible IPs Account Management Configuration Pre-shared Key System Log Settings Auto Warning
NPort 5450I	Account Management Configuration Pre-shared Key System Log Settings Auto Warnin E-Mail and SNMP Trap Settings Event Port Event System Log Capacity
MAC Address 00:90:E8:9A:E0:BF	Modify  Enable System Log Capacity Warning
Serial Number 4850	Warning at 0 (%)
Firmware Version Ver 3.14	Warning by Mail Trap System Log Oversize Action:
System Uptime 0 days, 00h:01m:00s	Overwrite the oldest system log

# **Upgrading the Firmware**

From time to time, Moxa would roll up new firmware for feature/security enhancement, patches, etc. It may be necessary to visit the NPort product website frequently to check for the latest firmware. You may also register for Moxa's website and follow the product updates so that you will be notified automatically about any recent activity. Check for **G. How to Become a Registered User of Moxa Website**.

Follow these steps to upgrade the firmware of an NPort.

1. Unlock the NPort you wish to configure. Right click a specific NPort and select the **Upgrade Firmware** function to upgrade the firmware.

File Eunction Configuration		te Configure We						
Function		ate contigure me		onfiguration	- 1 NPort(s	)		
NPort NPort	No 7	Model	MAC Address	IP Address	IP Address2	Server Name	Status	_
Configuration     Monitor     Port Monitor     COM Mapping     Y: IP Address Report	1	NPort 5250A	<b>ユ</b> 並	Broadcast Search Specify by IP Addre Locate	iss	NP5250A_7162	Unlock	
, g. n. rission rispan			r T	Unlock Configure Web				
			<b></b>	Upgrade Firmware Export Configuratio Import Configuratio				
				Assign IP Address				
	<							
essage Log · 5   Monitor Log	.0							
lo Time		Description						 -
3/27/2019 10: 3/27/2019 10: 3/27/2019 11: 3/27/2019 11: 3/27/2019 11: 3/27/2019 11:	57:43 AM 02:07 AM 02:07 AM	Found NPort(s): 1 Found NPort(s): 1 Load Configuration Unlock Fail: NPort	Fail: NPort 5250A (00:9 5250A (00:90:E8:63:50: 250A (00:90:E8:63:50:f	FD)				

2. Select the correct firmware file to load.

Select File		$\times$
Select File	D:\\NP5200A_Ver1.5_Build_19013022.rom	
	■ Browse	

3. Wait while the Upgrade Firmware action is processed.

Sta	itus					
ſ	Processin	g, please wait				X Cancel
	No	Model	MAC Address	IP Address	IP Address2	Status
	1	NPort 5250A	00:90:E8:63:50:	192.168.127.2	192.168.127.2	Transmit - 30%
	1					



## NOTE

You can simultaneously upgrade the firmware of multiple NPort units that are of the same model. To select multiple NPort units, hold down the Ctrl key when selecting an additional NPort, or hold down the Shift key to select a block of NPort units.

## **Export Configuration**

The Export Configuration function is a handy tool that can produce a text file that contains the current configuration of a particular NPort.

If you are using the NPort 5100 Series, NPort 5200 Series, or NPort IA5000 Series and Administration Suite v1.22 or above, to export the configuration of an NPort, right-click the targeted NPort, select **Export Configuration**. An Export Password window will pop up for the user to assign a password for the exported configuration file. The exported configuration file will be encrypted for security. You will need the same password you use for the exported file to import the same file back into the NPort.

Export Password		×
Enter Password		
1		
	🗸 ОК	🗙 Cancel

After assigning the export password, click the **Browse** button to set the file name and path, and then click **OK**.

Select File	×
Select File	
File Name:	Browse
	⊘ OK X Cancel

For the overall NPort 5000 Series with security enhanced firmware version, export configuration encryption will be based on the Pre-shared key defined in the NPort (default is empty password, and you may configure the password in **Configuration > Configuration Pre-shared Key**. So, when you are exporting the configuration file, you are only required to select the output file location. You may refer to page 96 for the security firmware version of your NPort.

## **Import Configuration**

The Import Configuration function is used to import an NPort configuration from a file into one or more of the same NPort model. To import a configuration, first select the target servers, right-click, and then select **Import Configuration**. Click on the **Browse** button to locate the configuration file and press **OK**.

Select I	File	×
	elect File	Browse
		Cancel

For the NPort 5100 Series, NPort 5200 Series, or NPort IA5000 Series and with NPort Administration Suite v1.22 or above, an **Import Password** window will pop up, and you will need to enter the password that is unique to the configuration file (which is assigned when exporting the configuration file) to successfully import the configuration file.

Export Password		×
Enter Password		
	🗸 ОК	X Cancel

For the overall NPort 5000 Series with a security enhanced firmware version, importing configuration decryption will be based on the pre-shared key defined in the NPort. If the pre-shared key does not match, you will see an error dialogue box on the screen.

Error	×
8	Import Configuration failed! Check sum error. The configure file was modified or import password is wrong.

You will then need to change the pre-shared key in **Configuration** to match the encryption password of the configuration file before you can import.

## ATTENTION

If you do not remember the password of the encrypted configuration file, there is no alternative way to decrypt the file.

nformation Model Name NPort 5430 ∀3	Account Management Configuration Pre-shared Key System Log Settings Auto Warnin Basic Network IP Address Report Serial Operating Mode Accessible IP
MAC Address 00:90:E8:9A:DF:7F	Server Name NP5430_4570
Serial Number 4570	✓ Modify       Time Zone     [GMT] Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London ▼       Local Date     12/15/2022
Firmware Version Ver 3.14	Local Time 2:51:48 PM
System Uptime O days, OOh:08m:36s	✓ Modify       ✓ Enable Web Console     ✓ Enable HTTPS Console(TLS v1.2)       □ TLS v1.0/v1.1 for HTTPS console     □ Enable Teinet Console       ✓ Enable Serial Console     □ Reset Button Protect       □ LCM Password Protect     Sensitive Data Encryption
	Maximum Login Users For Web Console 6 (1~6) Auto Logout Setting 5 (1~1440min)

You will be able to confirm the import content before downloading the file.

Press **OK** to start downloading the configuration file. A window will pop up to show that import was successful.



For firmware versions supporting encrypted configuration files, refer to the table below.

Model Name	Firmware version supporting encrypted configuration files.					
NPort 5000 Series						
NPort 5400 Series	Firmware v3.11 and up with NPort Administration Suite v1.22 and up					
NPort 5600-8-DT Series	Firmware v2.4 and up with NPort Administration Suite v1.22 and up					
NPort 5600-8-DTL Series	Firmware v1.3 and up with NPort Administration Suite v1.22 and up					
NPort 5600 Series	Firmware v3.7 and up with NPort Administration Suite v1.22 and up					
	NPort 5000A/IA5000A Series					
NPort 5100A Series	Firmware v1.3 and up (Support with both web console and NPort					
NPOIL STOOA Series	Administration Suite v1.22 or above)					
NPort 5200A Series	Firmware v1.3 and up (Support with both web console and NPort					
NFOIL SZOOA Series	Administration Suite v1.22 or above)					
NPort 5x50AI-M12 Series	Firmware v1.2 and up (Support with both web console and NPort					
INFOIL SXSUAL-MIZ Series	Administration Suite v1.22 or above)					
NPort IA5150A, NPort	Firmware v1.3 and up (Support with both web console and NPort					
IA5250A	Administration Suite v1.22 or above)					
NPort IA5450A	Firmware v1.4 and up (Support with both web console and NPort					
	Administration Suite v1.22 or above)					

## NOTE

- You can simultaneously import the same configuration file into multiple NPort units of the same model. To select multiple NPort units, hold down the **Ctrl** key when selecting an additional NPort, or hold down the **Shift** key to select a block of NPort units.
- 2. If you have an encrypted configuration file, you will need to use the NPort Administration Suite V1.22 or above to import an encrypted configuration file. On the other hand, if your configuration file is non-encrypted, it will also be accepted by the NPort Administration Suite V1.22 or above. (i.e., the NPort Administration Suite will not ask you to key in the **Import Password**.

## Monitor

Use the following method to start the Monitor function.

### Monitor > Add Target

1. Click **Monitor > Add Target** and select your targets from the list, and then click **OK**.

Ele <u>Function Monitor View H</u> elp	Stop					
Function	Add NPort			×		
Configuration			Rescan Selec			
Monitor     Port Monitor     COM Mapping     ······     IP Address Report	No ☑ 1	Model NPort 5430 V3	MAC Address 00:90:E8:9A:DF:7F	IP Address 192.168.127.254		
	¢			>		
	⊂ Input	h	Address NPort	_		

### **Once the Monitor Function Is Running:**

2. The added NPort will appear on the Monitor screen.

<u>File</u> <u>Function</u> Monitor <u>V</u> ie	w <u>H</u> e	elp						
🚉 🚄 👗 Exit Add Remo	ve	) Go	Stop					
Function				Monitor -	Stopped - 1	NPort(s)		
NPort	No	1	Model	MAC Address	IP Address	IP Address2		_
Configuration Monitor Pot Monitor Monitor Monitor Pot Monitor Pot Monitor Monitor	1		NPort 5430 V3	00:90:E8:3A:DF:7F	192.168.127.254			

3. Right-click the panel and select **Settings**.

🐝 NPort Admini	istrator-Moi	nitor						×
Eile Eunction	Monitor ⊻ie	w <u>H</u> elp						
Exit Add		re Go	Stop					
Functio	n			Monitor -	Stopped - 1	NPort(s)		
□ NPort		No /	Model	MAC Address	IP Address	IP Address2		
Configu		1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254			
COM M	Add Ta Add Ta Remov Load C Setting Go Stop	e Target onfigured C	OM Port					

4. Select or deselect **Monitor Items**. Use the single arrowhead buttons to move highlighted items from one box to the other. Use the double arrowhead buttons to move all items from one box to the other.

Monitor Items General Settings	Advanced	Settings	
De-selected Items Aive Server Name CDM Number	> >> <	Selected Items MAC Address IP Address IP Address IP Address2	•
Load Default	<<		

5. Select a **Refresh Rate** (the default is 3 seconds) on the General Settings page.

Monitor Settings		×
Monitor Items General Settings Advanced Settings		1
Refresh Rate: 3	Second(s)	
Auto save monitored NPort list.		
	🗸 ОК	🗙 Cancel

6. On the Advanced Settings page, select Display warning message for new event and/or Play warning music for new event. In the second case, you must enter the path to the WAV file you want to be played. "New event" means that one of the NPort units in the monitor is "Alive" or "Not Alive," or has lost connection with the Monitor program.

Monitor Settings	×
Monitor Items   General Settings   Monitor and Port Monitor Message Box Setting Display warning message for new event. Play warning music for new event. C:\Windows\Media\Alarm03.wav Browse }	
🗸 OK 🛛 🗶 Can	cel

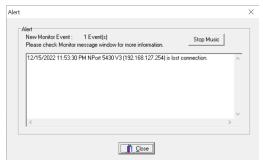
7. Right-click in the NPort list section and select **Go** to monitor the NPort.

🐝 NPort Administrator-Mc	nitor					_	$\times$
	w <u>H</u> elp						
👖 🗳 👗 Exit Add Remo	ve Go	Stop					
Function			Monitor - S	Stopped - 1	NPort(s)		
□-  NPort	No 🛆	Model	MAC Address	IP Address	IP Address2		
Configuration     Monitor     Monitor     GM Port Monitor     GM COM Mapping     ·································	1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254			

8. For this example, the NPort shown in the list will be monitored.

쑧 NPort Administrator-Mo	nitor					-	$\times$
	w <u>H</u> elp						
🚊 🗳 🎽 Exit Add Remo	ve Go	Stop					
Function			Monitor - I	Running - 1 I	NPort(s)		
□-  NPort	No 🛆	Model	MAC Address	IP Address	IP Address2		
Configuration	1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254			
- Monitor							
- Port Monitor							
COM Mapping							
······· ? IP Address Report							

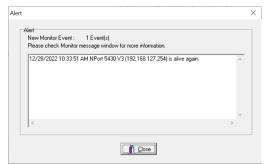
9. When one of the NPort units loses connection with the Monitor program, a warning alert will display automatically. The warning music will be played at the same time.



10. In the Monitor screen, you can see that the NPort units that are "Not Alive" are shown in red.

	v <u>H</u> elp								
🚉 🚄 📥 Exit Add Remov	e Go	Stop							
Function			Mo	onitor - Runn	iing - 1 NPo	rt(s)			
NPort	No /	Model	MAC Address	IP Address	IP Address2	Alive	Server Name	COM Number	Г
Configuration     Monitor     Configuration     Monitor     COM Mapping     P Address Report	1	NPort 5430 V3	00:90:E8:9A:D	192.168.127		Not Alive	NP5430_4570	10,11,12,	

11. If the NPort reconnects, a warning will remind the user that the NPort is now "Alive."



12. The NPort units that were reconnected, and are now "Alive," will be shown in black.

File Function Monitor Vie	)	•						
Exit Add Remo Function	ve G	io Stop	Monitor -	Running - 1 I	NPort(s)			
NPort	No /	Model	MAC Address	IP Address	IP Address2	Alive	Serve	r Name
Configuration     Monitor     Orther Monitor     Orther Monitor     COM Mapping     PAddress Report	1	NPort 5430 V3	00:90:E8:SA:DF:7F	192.168.127.254		Alive	NP54	30_457

## **Port Monitor**

The process described here is the same as in the previous "Monitor" section. The only difference is that you can select more items under Port Monitor than under Monitor.

File Eunction Port Monitor	<u>V</u> iew <u>H</u> elp						
👖 🗳 🎽 Exit Add Remo	ve Go	Stop					
Function			Port Monito	r - Stopped -	6 Port(s)		
NPort	No /	Model	MAC Address	IP Address	IP Address2	Port	OP Mode
Configuration	✓ 1	NPort 5232	00:90:E8:7B:10:E4	192.168.127.104	192.168.127.104	1	Real COM Mode
Monitor	2	NPort 5232	00:90:E8:7B:10:E4	192.168.127.104	192.168.127.104	2	Real COM Mode
Port Monitor	<b>∀</b> 3	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254		1	Pair Conn. Slave
COM Mapping	✔ 4	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254		2	Pair Conn. Slave
IP Address Report	₹ 5	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254		3	Pair Conn. Slave
	6	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254		4	Pair Conn. Slave

Right-click on Port Monitor and select or deselect **Monitor Items**. Use the single arrowhead buttons to move highlighted items from one box to the other or the double arrowhead buttons to move all items in one box to the other.

Monitor Items General Settings		
De-selected Items Airve Conn Status Remote IP Serial Line Status Tx/Rx after Conn. Tx/Rx after Mon. Tx/Rx after Mon. Tx/Rx Intv Throu. COM Number Server Name Ailas	Selected Item Model MAC Address IP Address2 Part OP Mode < <	\$\$
Load Default		

## **COM Mapping**

This section covers how to map the COM ports on a Windows PC to NPort device ports. The mapping will allow Windows software to access serial devices over the network as if they were local COM devices, providing instant device networking without software migration. COM mapping is supported in Real COM and RFC2217 modes only.

NPort Administration Suite comes with Windows Real COM drivers. After you install the NPort Administration Suite, there are two ways to set up the NPort's serial port as your host's remote COM port.

The first way is with On-line COM Mapping. On-line COM Mapping will make sure that the NPort is connected correctly to the network and then install the driver on the host computer.

The second way is with Off-line COM Installation, without first connecting the NPort to the network. Off-line COM Mapping can decrease the system integrator's effort by solving different field problems. Via offline installation, users can first process software installation for the host, and then install the NPort to different fields.

The following instructions are for device ports operating in Real COM mode. For device ports operating in RFC2217 mode, follow the instructions for your particular driver. Real COM mode also supports TTY port mapping of Linux and UNIX systems.

Use the following procedure to map COM ports:

#### On-line COM Mapping:

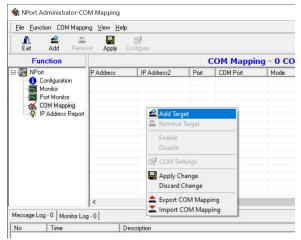
Connect the NPort to the network > Set the NPort's IP address > Map COMs to your host > Apply Change.

#### Off-line COM Mapping:

Map COMs to your host > Apply Change > Connect the NPort to the network > Configure the NPort's IP address.

## **Online COM Mapping**

1. Select the COM Mapping function group and right-click Add Target.



2. Add the target to which you would like to map COM ports, select the NPort to which you would like to map COM ports.

Select F	rom List F	lescan Selec	All	Clear All
No	Model	MAC Address	IP Addr	ess
<b>⊻</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.16	8.127.254

3. COM ports and their mappings will appear in blue until they are "**Apply**". Next, select **COM Settings** to change COM No., default setting, etc.

File Eunction COM Mappin	ig ⊻iew <u>H</u>	elp							
👖 🔮 👗 Exit Add Remov	e Apply	Configure							
Function			C	OM Mapping -	4 COM				
- D NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mod	e	
Configuration     Monitor     Monitor     Ort Monitor     COM Mapping     PAddress Report	1 2 3 4	NPort 5430 V3 NPort 5430 V3 NPort 5430 V3 NPort 5430 V3	192.168.127 4 192.168.127 -	Add Target Remove Target Enable Disable COM Settings		COM2 + COM3 + COM4 + COM7 +	Hi-P Hi-P	erformance erformance erformance	FIFO
				Apply Change Discard Change Export COM Mapp Import COM Mapp	-				

#### 4. Select the **COM Number**.

COM ports that are "In use" or "Assigned" will also be stated in this drop-down list. If you select multiple serial ports or multiple NPort units, remember to check the **Auto Enumerating COM number for selected ports** function to use the COM No. you select as the first COM No.

COM Port Settings ×
Port Number: 4 Port(s) Selected. 1st port is Port 1
Basic Settings Advanced Settings Serial Parameters COM Grouping
COM Number COM2 (current) (assigned)
Auto enumer COM2 (current) (assigned) COM3 (assigned) COM4 (assigned) COM4 (in use) COM6 (in use) COM6 (in use) COM7 (assigned) COM7 (a
COM9 V
✓ OK 🗶 Cancel

#### **Advanced Settings**

Port Number:	4 Port(s) Selected. 1st port is Port 1	
Basic Settings Ad	vanced Settings   Serial Parameters	COM Grouping
Tx Mode	Hi-Performance	•
FIFO	Enable	•
Network T	imeout 5000 (500-200	00 ms)
☐ Alway ☐ Ignore	ish (only flush local buffer) Accept Open Requests Tx Purge all selected ports	
	ОК	X Cancel

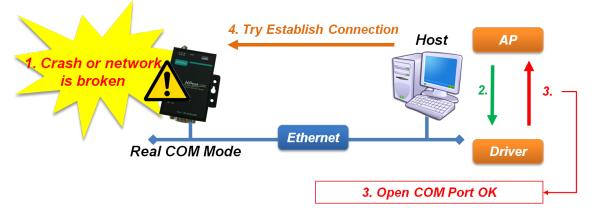
**Tx Mode: Hi-performance mode** is the default for Tx mode. In Hi-Performance mode, the driver immediately issues a "Tx Empty" response to the program after sending data to the NPort. Under **Classical Mode**, the driver sends the "Tx Empty" response until all Tx data has been sent out from the NPort and a confirmation is received from the NPort. Classical mode is recommended if you want to ensure that all data is sent out before further processing, however, this mode will cause lower throughput.

**FIFO: Enable/Disable Tx/Rx**. If disabled, the NPort will send one byte each time the Tx FIFO becomes empty; and a Rx interrupt will be generated for each incoming byte. This will cause a faster response and lower throughput. If you want to use XON/XOFF flow control, we recommend setting FIFO to Disable.

**Network Timeout:** Specifies when an open, close, or serial parameter change operation will time out. **Fast Flush (only flush local buffer)** 

- We have added one optional Fast Flush function to Moxa's new NPort Real COM driver. NPort Administrator Suite for NPort adds it after version 1.2.
- For some applications, the user's program will use the Win32 "PurgeComm()" function before it reads or writes data. With our design, after the program uses this Purge Comm() function, the NPort driver will keep querying the NPort's firmware several times to make sure there is really no data queued in the NPort firmware buffer, rather than just flushing the local buffer. This kind of design is used because of some special considerations. However, it might take more time (on the order of several hundred milliseconds) than a native COM1, because it needs to work via Ethernet. That's why the native COM ports on the motherboard can work fast with this function call, but the NPort requires much more time. To accommodate other applications that require a faster response time, the new NPort driver implements a new "Fast Flush" option. Note that, by default, this function is disabled.
- To begin with, make sure there are some "PurgeComm()" functions being used in your application program. In this kind of situation, you might find that your NPort exhibits a much poorer operation performance than when using the native COM1 port. Once you have enabled the "Fast Flush" function, you can check to see if there has been an improvement in performance.
- By default, the optional "Fast Flush" function is disabled. If you would like to enable this function, from the "NPort Administrator," double click the COM ports that are mapped to the NPort, and then select the "Fast Flush" checkbox. You should find that when "Fast Flush" is enabled, the NPort driver will work faster with "PurgeComm()."

**Always Accept Open Requests:** Even the driver cannot establish the connection to NPort, user's software still can open the mapped COM port just like an onboard COM port.





5. The Serial Parameter settings shown here are the default settings when the NPort is powered on. However, the program can redefine the serial parameters to different values after the program opens the port via Win 32 API.

Basic Settings	Advanced Setting:	s Serial Parameters	COM Grouping
Baud F	Rate	9600 💌	
Parity	ĺ	None 💌	
Data B	lits	8 🔻	
Stop B	its	1 💌	
Flow C	Control	None 💌	
🔽 An	nlv all selected port	2	
<b>▼</b> Ap	ply all selected port	s	

6. After setting the COM Mapping, remember to select **Apply Change** to save the information in the host system registry. The host computer cannot use the COM port until after **Apply Change** is selected.

🚉 🗳 🎽 Exit Add Remov	e Apply	Configure					
Function				COM	1 Mapping -	<b>4 COM</b>	
- NPort	No	Model		IP Address /	IP Address2	Port	CO
Configuration	1	NPort 543		192.168.127.254		1	CO
Monitor     CM Mapping     Yot Monitor     GM Mapping     Yot IP Address Report	2 3 4	NPort 543 NPort 543 NPort 543	Add Are En Di: CC Are Di: CC CC Are Di: CC CC CC CC CC CC CC CC CC C	d Target move Target able able DM Settings ply Change card Change port COM Mapping port COM Mapping		4	
Message Log - 0 Monitor Log	< .0]	Description				1	

Or, select **Discard Change** to if you wish NOT to save the COM Mapping information to the host.

7. To save the configuration to a text file, select **Export COM Mapping**. You will then be able to import this configuration file to another host and use the same COM Mapping settings in the other host.

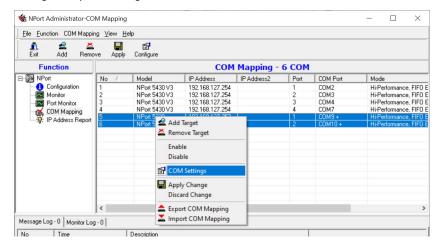


## **Offline COM Mapping**

1. Add a target by inputting the IP address and selecting the Model Name without physically connecting the NPort to the network.

" Select F	rom List	Rescan	Sele	et All	Clear All
No Model		MAC	CAddress	IP Address	
<					;
Input Ma	anually	IP Addres	s 192.1	68.127.254	
		Model	NPor	5110	
		Ports		5230 5232 5232I 5210A	
				5230A 5250A	

2. Change the port settings as needed.



3. Right-click in the NPort list section and select **Apply Change**.

🚉 🔮 👗 Exit Add Remo	ve Apply	Configure					
Function			COM	Mapping -	6 COM		
- D NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance, FIF
- 🔼 Monitor	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance, FIF
- Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM4	Hi-Performance, FIF
- 📶 COM Mapping	4	NPort 5430 V3	192.168.127.254		4	COM7	Hi-Performance, FI
IP Address Report	5	NPort 5230	192.168.12	117		COM9 +	Hi-Performance, FI
	6	NPort 5230	102.100.12	dd Target		COM10 +	Hi-Performance, FI
			🚔 Re	move Target			
				able			
			Di	sable			
			COM Settings				
			EL C	Jivi Settings			
				oply Change			
				scard Change			

## **COM** Grouping

The **COM Grouping** function simulates the multidrop behavior of serial communication over an Ethernet network. COM Grouping allows you to create a COM Group and redirect data from it to several physical COM ports on NPort device servers. With COM Grouping, you can control multiple physical serial ports simultaneously by operating only one COM port.

## **Creating a COM Group**

Follow the steps below to add multiple COM ports into one group:

1. Select serial port(s) for the group that you are going to create, and right-click to select COM Settings.

👖 🔮 🎽 Exit Add Remo	ve Apply	Configure					
Function			CON	1 Mapping -	6 COM		
NPort NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mode
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance, Fl
- 🔂 Monitor	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance, FIF
		NPort 5430 V3	192.168.127.254		3	COM4	Hi-Performance, FIF
🔣 COM Mapping	4	NPort 5430 V3	192.168.127.254		4	COM7	Hi-Performance, FIF
□ 茶 IP Address Report	5	NPort 5220	1 100 100 107 050		1	COM9 +	Hi-Performance, FIF
	6	NPort 5 🗳 Ado	nove Target		2	COM10 +	Hi-Performance, FIF
		Ena					
		😭 CO	COM Settings				
			oly Change card Change				
	<		ort COM Mapping	_		_	

 Select a COM number for this COM group. You may select one port already assigned to a member of the COM Group. However, once the COM Group is configured, all the original COM number(s) within the group will be released simultaneously.

COM Port Settings	5	×
Port Number:	2 Port(s) Selected. 1st port is Port 5	
Basic Settings	Advanced Settings Serial Parameters COM Gro	ouping   
COM Nu	Imber COM11 -	
🖂 Auto	enumer COM9 (current) (assigned)	
🗔 Grou	Iping sele COM12 COM13	
	COM14 COM15	
	СОМ16 🗸	
	🗸 OK 🛛 🗶 Ca	incel



## ATTENTION

The COM Grouping function only supports Windows NT, 2000, and later. The maximum number of ports for each group is 32.

3. Select the **Grouping selected port(s) together** checkbox.

СОМ	Port Settings X
Po	ort Number: 2 Port(s) Selected. 1st port is Port 5
Basi	ic Settings Advanced Settings Serial Parameters COM Grouping
	COM Number COM11
	Auto enumerating COM number for selected ports.
	Grouping selected port(s) together.
	🗸 OK 🛛 🗶 Cancel

4. On the **COM Grouping** page, you can set "Read" and "Write" permissions for every serial port. It is necessary to set **Signal Status** to control the data transmission with specified control signals (e.g., DTR/RTS). You can assign one serial port which signals will be considered by the COM Group.

COM Port Settings						
Port Number: 2	2 Port(s)	Selected	l. 1st port	is Port 5		
Basic Settings Adva	inced S	ettings	Serial Par	ameters	СОМ (	Grouping
Serial ports:						
IP Address	Port	Read	Write	Signal	Status	
192.168.127.253 192.168.127.253		<u>द</u>	<ul><li></li></ul>			
				ОК	×	Cancel

5. Click **OK**, and confirm the serial ports that were assigned. The COM Port column shows that your selected ports are labeled as part of a "Group." You will be able to view the serial ports that were assigned to and removed from the Group. Click **Apply** to apply the settings.

File Function COM Mappir	ng <u>V</u> iew <u>H</u> el	lp .					
🗼 🗳 🛎		P					
Exit Add Remo	ve Apply	Configure					
Function			СОМ	Mapping -	6 СОМ		
NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance, FIFO
- Monitor	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance, FIFO
- Revenue Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM4	Hi-Performance, FIFO
	4	NPort 5430 V3	192.168.127.254		4	COM7	Hi-Performance, FIFO
COM Mapping	5	NPort 5230	192.168.127.253		1	COM11 (Group1	Hi-Performance, FIFO
	6	NPort 5230	192.168.127.253		2	COM10 (Group1	Hi-Performance, FIFO

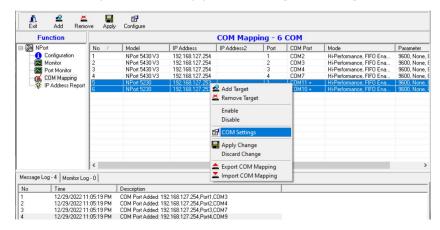
6. Finally, click **Yes** to confirm.

Informat	ion X	
0	Do you want to apply the changes?	
	<u>Y</u> es Cancel	

### **Deleting a COM Group**

Follow the steps below to delete a COM Group and then auto-assign COM numbers for each port in the Group:

1. Select all serial ports in the Group you are deleting and then right-click to select COM Settings.



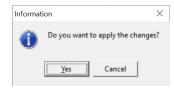
2. Uncheck Grouping selected port(s) together first then select a COM number for this COM group and check the **Auto enumerating COM number for selected ports** to use the COM number you select as the first starting COM number, and then click **OK**.

COM Port Settings			×
Port Number: 2 Por	t(s) Selected	d. 1st port is Port 5	5
Basic Settings Advance	d Settings	Serial Parameters	COM Grouping
COM Number	COM13		<b>.</b>
🔽 Auto enumer	COM16		↑ts.
🗖 Grouping sele	COM19		
	COM20 COM21		
	COM21		_
	COM23		~
		🗸 ок	🗶 Cancel

3. You can view the serial ports that were assigned to and removed from the Group. Click **Apply** to apply the settings.

Eile Eunction COM Mappir	ng <u>V</u> iew <u>H</u> e	lp .							
<u>i</u> <u>2</u> 🛎		đ							
Exit Add Remo	ve Apply	Configure							
Function			СОМ	Mapping -	6 СОМ				
- NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mod	le	
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-P	erformanc	e, FIFO
- Monitor	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-P	erformanc	e, FIFO
- Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM4	Hi-P	erformanc	e, FIFO
	4	NPort 5430 V3	192.168.127.254		4	COM7	Hi-P	erformanc	e, FIFO
COM Mapping	5	NPort 5230	192.168.127.253		1	COM20	Hi-P	erformanc	e, FIFO
W. IF Address Report	6	NPort 5230	192.168.127.253		2	COM21	Hi-P	erformanc	e, FIFO

4. Finally, click **Yes** to confirm.



### Adding an Additional Port to a COM Group

Follow the steps below to add a serial port into an existing COM Group:

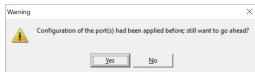
1. Select the serial port and the COM Group that you wish to bind and right-click to select COM Settings.

Eile Eunction COM Mappin									
Function				СОМ	Mapping -	6 COM			
No / Model IP Address IP Address2 Port							COM Port	Mode	
Configuration     Monitor     Port Monitor	1 2 3	NPort 54 NPort 54 NPort 54	30 V3	192.168.127.254 192.168.127.254 192.168.127.254		1 2 3	COM2 COM3 COM4 (Group1)	Hi-Performar Hi-Performar Hi-Performar	nce, FIFO
COM Mapping	4 5		Add Targe	at		4	COM7 (Group1)	Hi-Performan	
IP Address Report	6	NP 📥	Remove 1 Enable Disable			2	COM20 COM21 (Group1)	Hi-Performar Hi-Performar	
		s	COM Sett	ings					
			Apply Ch Discard C	-					
	<			OM Mapping OM Mapping					3

2. Make sure Grouping selected port(s) together is checked and then click OK.

COM Port Settings ×
Port Number: 2 Port(s) Selected. 1st port is Port 4
Basic Settings Advanced Settings Serial Parameters COM Grouping
COM Number COM7 (current) (Group)
Auto enumerating COM number for selected ports.
Grouping selected port(s) together.
OK X Cancel

3. Confirmation for the changes, click **Yes** to apply the settings.



4. You can view the serial ports that were assigned to and removed from the Group. Click **Apply** to apply the settings.

NPort Administrator-CO		5						×
Eile Eunction COM Mappir	ng ⊻iew Į	Help						
👖 🗳 🛎		p.						
Exit Add Remov	e Apply	Configure						
Function			СОМ	Mapping -	6 СОМ			
NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode	
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performanc	e, FIFO
	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performanc	e, FIFO
Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM4 (Group1)	Hi-Performanc	e, FIFO
	4	NPort 5430 V3	192.168.127.254		4	COM7 (Group1)	Hi-Performanc	e, FIFO
Com mapping	5	NPort 5230	192.168.127.253		1	COM20 (Group1)	Hi-Performanc	e, FIFO
······································	6	NPort 5230	192.168.127.253		2	COM21 (Group1)	Hi-Performanc	e, FIFO

5. Finally, click **Yes** to confirm.

Informat	ion	×	
0	Do you want t	o apply the changes?	
	Yes	Cancel	

## **Removing a Port from a COM Group**

Follow the steps below to remove a serial port from a COM Group:

1. Select a serial port in the Group and right-click to select **COM Settings**.

NPort Administrator-CO <u>File</u> <u>Function</u> COM Mappir								- 0	×
👖 🔮 👗 Exit Add Remov	Apply Configure								
Function				СОМ	Mapping -	6 COM			
∃- 🔊 NPort	No 🛆	Model	IP Addr	828	IP Address2	Port	COM Port	Mode	_
Configuration     Monitor     Port Monitor     COM Mapping	1 2 3 4	NPort 5430 V3 NPort 5430 V3 NPort 5430 V3 NPort 5430 V3 NPort 5430 V3	192.168 192.168	127.254 127.254 127.254 127.254		1 2 3 4	COM2 COM3 COM4 (Group1) COM7 (Group1)	Hi-Performance, Hi-Performance, Hi-Performance, Hi-Performance,	FIFC
P Address Report	5 6	NPort 5230 NPort 5230	192.168	🙅 Add 1 🎽 Remo	arget ve Target		COM20 (Group1) COM21 (Group1)	Hi-Performance, Hi-Performance,	
				Enabl Disab	-				
				🗗 СОМ	Settings				
				Apply Disca	Change rd Change				
Message Log · 2 Monitor Log	<		1	_	t COM Mapping t COM Mapping				

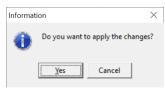
2. Select a COM number that is not in use or assigned to a group and click **OK**.

COM Port Settings	>
Port Number: 1 Port(s) Selected. 1st port is Port 5	
Basic Settings Advanced Settings Serial Parameters C	OM Grouping
COM Number COM20 (current) (assigned)	
Auto enumerating COM number for selected point	rts.
Grouping selected port(s) together.	
🗸 ок	🗶 Cancel 🛛

3. You can view the serial ports that were assigned to and removed from the group. Click **Apply** to apply the settings.

ile <u>Function</u> COM Mappir	ng <u>V</u> iew <u>H</u> e	lp						
🚉 🗳 👗 Exit Add Remov	e Apply	Configure						
Function			СОМ	Mapping -	6 СОМ			
NPort NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode	
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance.	FIFO
- Monitor	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance,	FIFO
- R Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM4 (Group1)	Hi-Performance,	FIFO
	4	NPort 5430 V3	192.168.127.254		4	COM7 (Group1)	Hi-Performance,	FIFO
- 🚮 COM Mapping - 🔆 IP Address Report	5	NPort 5230	192.168.127.253		1	COM20	Hi-Performance,	FIFO
W IF Addless Report	6	NPort 5230	192.168.127.253		2	COM21 (Group1)	Hi-Performance,	FIFO

4. Finally, click **Yes** to confirm.



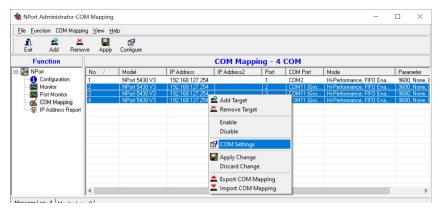
## Modify Ports in a COM Group

For version v4.0 and after, to change COM number of a specific serial port in a COM group, you need to ungroup the COM group and then proceed with COM port re-assignment as explained in **On-line COM Mapping** and **Off-line COM Mapping** section.

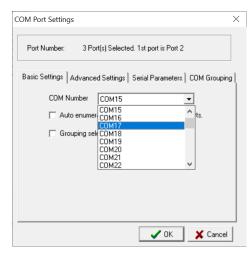
For version before v4.0, the following subsections we examine three ways in which the serial ports in a COM group can be changed:

#### Changing the COM Number of a COM Group

1. Select all serial ports in the group and right-click to select **COM Settings**.



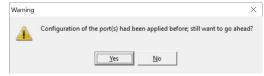
2. Select a COM number that is not in use or assigned to a group.



3. Select the **Grouping selected port(s) together** checkbox and then click **OK**.

COM Port Settings	×
Port Number: 3 Port(s) Selected. 1st port is Port 2	
Basic Settings Advanced Settings Serial Parameters COM Gro	ouping
COM Number COM17 -	
Auto enumerating COM number for selected ports.	
Grouping selected port(s) together.	
🗸 ОК 🛛 🗶 Са	ncel

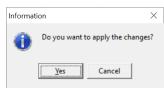
4. Confirmation dialogue would appear, click **Yes**.



- 5. You can view the serial ports that were assigned to and removed from the group.
- 6. Click **Apply** to apply the settings.

Eile Eunction COM Mappin	ng <u>V</u> iew <u>H</u> e	lp .						
<u>i</u> 👱 🛎		đ						
Exit Add Remo	ve Apply	Configure						
Function				СОМ Марр	oing - 4	СОМ		
- NPort	No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode	Parameter
Configuration	1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance, FIFO Ena	9600, None
Monitor	2	NPort 5430 V3	192.168.127.254		2	COM17 (Gro	Hi-Performance, FIFO Ena	9600, None
- Port Monitor	3	NPort 5430 V3	192.168.127.254		3	COM17 (Gro	Hi-Performance, FIFO Ena	9600, None
	4	NPort 5430 V3	192.168.127.254		4	COM17 (Gro	Hi-Performance, FIFO Ena	9600, None
COM Mapping								
Ar in Address Treport								

7. Finally, click **Yes** to confirm.



#### Changing Advanced Settings and Serial Parameters of the COM Group

1. Click any COM port in **COM Group** and right-click **COM Settings** to check the port specified on the **COM Grouping** page as the signal port.

Port Number: 1	Port(s)	) Selected	l. 1st port	is Port 2	
asic Settings Adva	nced S	ettings	Serial Par	ameters COM	Group
Serial ports:		- 1			
IP Address	Port	Read	Write	Signal Status	
192 168 127 254	2				
192.168.127.254	3				
192.168.127.254	4	14	14		
1					

2. Select the "Signal Status" controlled port and then right-click and select **COM Settings**.

🚉 🔮 👗 Exit Add Remo	ve Apply	<b>⊡</b> Configure						
Function				СОМ Марр	oing - 4	СОМ		
- D NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mode	Parameter
-1 Configuration - Configuration	1 2	NPort 5430 V3 NPort 5430 V3	192.168.127.254 192.168.127.254		1 2	COM2 COM17 (Gro	Hi-Performance, FIFO Ena Hi-Performance, FIFO Ena	9600, None, 9600, None,
Port Monitor     GOM Mapping     PAddress Report	4	Ena Dis	d Target nove Target ible able M Settings		4	COM17 (Gro COM17 (Gro	Hi-Performance, FIFD Ena Hi-Performance, FIFD Ena	9600, None, 9600, None,
			ply Change card Change					
	<		ort COM Mapping					

3. The Advanced Settings and Serial Parameters pages will be available for modification.

COM Port Settings	× COM Port Settings	$\times$
Port Number:       1 Port(s) Selected. 1st port is Port 3         Basic Settings       Advanced Settings         Serial Parameters       COM Grouping         Tx Mode       Hi-Performance         FIFD       Enable         Network Timeout       5000         [Soudow for the second parameters]       Soudow for the second parameters         Alway Accept Open Requests       Ignore Tx Purge         Apply all selected ports       X ancel	Baud Rate     9600       Parity     None       Data Bits     8       Stop Bits     1       Flow Control     None       Apply all selected ports	eters) COM Grouping

#### Changing the Serial Port Specified as a Signal Port for the COM Group

1. Select a serial port in the group and then right-click and select **COM Settings**.

🚊 🗳 🎽 Exit Add Remo	ve Apply	S Configure						
Function				COM Map	ping - 4	СОМ		
B NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mode	Parameter
Configuration 1 Monitor 2 Configuration 2 COM Mapping 4 	2	NPort 543 NPort 543	30 V3 192.168.127.25		1 2	COM2 COM17 (Gro		9600, None 9600, None
			Add Target     Remove Target     Enable     Disable		3	COM17 (Gro COM17 (Gro	Hi-Performance, FIFO Ena Hi-Performance, FIFO Ena	9600, None, 9600, None,
			COM Settings Apply Change Discard Change					
	<		Export COM Mappin					

2. Check the **Grouping selected port(s) together** checkbox.

COM Port Settings
Port Number: 1 Port(s) Selected. 1st port is Port 3
Basic Settings Advanced Settings Serial Parameters COM Grouping
COM Number COM17 (current) (assigned)
Auto enumerating COM number for selected ports.
Grouping selected port(s) together.
🗸 OK 🛛 🗶 Cancel

3. On **COM Grouping** page, you can specify one serial port whose signals will be considered by the COM group and change the Read/Write status for each serial port.

OM Port Settings						
Port Number:	1 Port(s)	Selected	l. 1st port	is Port 3		
Basic Settings Adva	anced S	ettings	Serial Par	ameters	СОМ (	Grouping
Serial ports:						
IP Address	Port	Read	Write	Signal	Status	
192.168.127.254	2					_
192.168.127.254	-	$\checkmark$	$\checkmark$	Г		
192.168.127.254	4	$\checkmark$	$\checkmark$			

# **IP Address Report**

When the NPort is used in a dynamic IP environment, users must spend more time on IP management tasks. NPort serial device servers help by periodically reporting their IP address to the IP location server, in case, the dynamic IP has changed.

1. Configure the NPort with Dynamic IP settings (DHCP, BOOTP, or DHCP/BOOTP). Assign the remote Auto IP report server's IP address and UDP port.

Information Model Name		to Warnir
NPort 5430 V3		essible IF
MAC Address 00:90:E8:9A:DF:7F	Modify Server Name NP5430_4570	-
Serial Number	Modify	
4570	Time Zone (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London 💌	
	Local Date 12/29/2022	1
Firmware Version	Local Time 2:58:26 PM +	
Ver 3.14	Time Server	1
System Uptime	☐ Modify	-
0 days, 00h:34m:06s	Enable Web Console	
	TLS v1.0/v1.1 for HTTPS console     Enable Telnet Console     Enable Serial Console     Reset Button Protect	
	LCM Password Protect	
	Sensitive Data Encryption MD5/AES128	
	Modify         6         (1~6)           Auto Logout Setting         5         (1~140min)	

2. In **Administrator function groups** pane, select the **IP Address Report**, and click the **Settings** on the toolbar or right-click to select **Settings**.

Eile Eunction IP Address I	Report ⊻iew	<u>H</u> elp						
L International Settings Go	Stop							
Function		1	IP Address Rep	ort - Stoppe	d - Port	:4002 - 0		
NPort Configuration Monitor Of Monitor COM Mapping Y IP Address Report	No A	Model	MAC Address	IP Address	Count	Previous Time	Last Tir	ne

3. Configure the Local Listen Port to be the same as the NPort's "Auto report to UDP port" setting.

IP Lo	ocation Settings		×
	Local UDP Listen Port	4002	
		ОК	🗙 Cancel

4. Click Go on the toolbar or right-click to receive the Auto IP address report from the NPort.

Eile Eunction IP Address R	eport ⊻iew	<u>H</u> elp						
🚉 🗗 🕨 Exit Settings Go	Stop							
Function		(i) (i)	(P Address Rep	ort - Stoppe	d - Port	:4002 - 0		
NPort Configuration Monitor Fort Monitor COM Mapping Yell Address Report	No /	Model	MAC Address	IP Address	Count	Previous Time	Last Tin	ie

### NOTE

You can simultaneously change the configurations of multiple NPort units that are of the same model. To select multiple NPort units, hold down the Ctrl key when selecting additional NPort units, or hold down the Shift key to select a group of NPort units.

# **Configuring by NPort Windows Driver Manager**

NPort Windows Driver Manager is intended for use with NPort 5000 serial ports that are set to Real COM mode. The software manages the installation of drivers that allow you to map unused COM ports on your PC to serial ports on the NPort 5000. When the drivers are installed and configured, devices that are attached to serial ports on the NPort 5000 will be treated as if they were attached to your PC's own COM ports.

Double-click on the **NPort Windows Driver Manager** icon when you download it from the Moxa website to follow the installation steps to complete the setup.

On Windows XP, the installer will display a message that the software has not passed Windows Logo testing. This is shown:



Click Continue Anyway to finish the installation.

# **Using NPort Windows Driver Manager**

#### NOTE

You will need to install the latest of Visual Studio in order to run COM mapping.

#### **Real COM Mode**

After you install NPort Windows Driver Manager, you can set up the NPort 5000's serial ports as remote COM ports for your PC host. Make sure that the serial port(s) on your NPort 5000 are set to Real COM mode when mapping COM ports with the NPort Windows Driver Manager.

- 1. Launch the NPort Windows Driver Manager
- 2. Click the Add icon

쑧 NPort Windows Driver Manage	r	_	$\times$
	<u>V</u> iew <u>H</u> elp		
Exit Add Remove Ap	k 📴 🗊 ply Undo Setting		
No COM Port	Address 1	Address 2	

3. Click **Search** to search for NPort device servers. From the list that is generated, select the server to which you will map COM ports, and then click **OK**. The default IPv4 address will be changed to the IPv6 address when **Mapping IPv6 COM Port** is checked.

	☐ Mapping IPv6 COM Port		Search Select All Clear All				
No	Model	MAC 1	Address 1	MAC 2	Address 2		
<b>v</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254				
<							
nnut l	Manually						
	Manually	Pourse Pool COM					
	Manually COM Redundant COM	Reverse Real COM					
Real	COM Redundant COM	Reverse Real COM	First Map;				
Real		Reverse Real COM	Data Port	950	_		
Real NF	COM Redundant COM	Reverse Real COM		950 I Port 966			

### NOTE

Only the NPort 6000 models support IPV6.

4. Alternatively, you can select **Input Manually** and then manually enter the NPort IP Address, 1st Data Port, 1st Command Port, and Total Ports to which COM ports will be mapped. Click **OK** to proceed to the next step. Note that the Add NPort page supports FQDN (Fully Qualified Domain Name), in which case the IP address will be filled in automatically.

Select From List			Search Select All Clear All				
No	Model	MAC 1	Address 1	MAC 2	Address 2		
<b>₽</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254				
<							
Input	Manually						
Real	COM Redundant COM	Reverse Real COM					
			First Mappin	g Port			
NF	Port IP Address 192.168.1	27.253	Data Port	950			
-	Enable Auto IP Report		Command P	ort 966			
J			Total Ports	1			

5. COM ports and their mappings will appear in blue until they are activated. Activating the COM ports saves the information in the host system registry and makes the COM port available for use. The host computer will not use the COM port until the COM ports are activated. Click **Yes** to activate the COM ports at this time or click **No** to activate the COM ports later.

<u>F</u> ile <u>C</u>	OM Mapping Configuration View	Help			
<u>Exit</u>	Add Remove Apply U				
No	COM Port /	Address 1	Address 2		
1 2 3 4	+COM1 +COM5 +COM6 +COM8	192.168.127.254     950.966 (Port1)       192.168.127.254     951.967 (Port2)       192.168.127.254     952.968 (Port3)       192.168.127.254     953.969 (Port3)       192.168.127.254     953.969 (Port4)       Information       Information     Information       Information       Information       Information       Information       Information       Information	X Yort now?		
	M Port - 0				

6. In Windows XP, a message is displayed during activation of each port, showing that the software has not passed Windows Logo certification. Click **Continue Anyway** to proceed.

Hardwa	re Installation
1	The software you are installing for this hardware: NPort Communication Port 1 has not passed Windows Logo testing to verify its compatibility with Windows XP. [Tell me why this testing is important.] Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
	Continue Anyway STOP Installation

7. A confirmation dialogue would show upon activation is success, and all ports that have been activated will change to black.

Informa	ation		×			
0	COM Port Configuration is applied su Remember to change NPort operation		OM Mode.			
🐝 NP	Port Windows Driver Manager				_	×
<u>F</u> ile	<u>COM Mapping</u> Configuration View H	elp				
Ē. Exi		Setting				
No	COM Port	Address 1		Address 2		
1 2 3 4	COM1 COM5 COM6 COM8	192168127.254 192168127.254 192168127.254 192168127.254	950:966 (Port1) 951:967 (Port2) 952:968 (Port3) 953:969 (Port4)			
otal C	OM Port - 4					

N

#### NOTE

The Redundant COM Mode and Reverse Real COM Mode are available for the NPort 6000 models only.

## Configure the mapped COM ports

For Real COM Mode, to reconfigure the settings for a particular serial port on the NPort 5000, select the row corresponding to the desired port and then click the **Setting** icon.

<u>File</u>	OM Mapping	Configura	ation ⊻ie	w <u>H</u> elp	)						
E xit	din Add	Constant Remove	Apply	Undo	Setting						
No	COM Port	1			AC COM	Setting (	Ctrl+C)		Address 2		
1	COM1				192.168.		950:966	(Port1)		 	
2	COM5				192.168.	127.254	951:967	(Port2)			
3	COM6				192.168.	127.254	952:968	(Port3)			
4	COM8				192.168.	127.254	953:969	(Port4)			

On the **Basic Setting** window, use the **COM Number** drop-down list to select a COM number to be assigned to the NPort 5000's serial port that is being configured. When you have selected multiple ports, you may select the **Auto Enumerating COM Number for Selected Ports** option to automatically assign available COM numbers in sequence to selected serial ports. Note that ports that are "in use" will be labeled accordingly.

Port Number:	1 Port(s) are Selected.	
asic Settings Adv	anced Settings   Serial Parameters   Secu	rity   IPv6 Setting
🗖 Auto Enumeral	ing COM Number for Selected Ports.	
COM Number	COM12 💌	
Enable CO	COM12  COM13 COM14 COM15 COM16 COM17 COM17 COM18 COM18 COM17 COM18	Add COM
	сом19 🗸	
	B	emove COM
<b>0</b>		
<u>?</u> <u>H</u> elp		

#### **COM Splitting**

The "COM Splitting" allows you to redirect data from the same serial port to several virtual COM ports on your computer. Remember, you need to adjust **Max Connection** in your NPort. For example, if you split to two COM ports, **Max Connection** needs to be adjusted to 2. Refer to the **Max Connection** introduction in the User Manual regarding configuration and number limitation.

#### 1. Enabled COM Splitting

Port Number:	1 Port(s) are Selected.	
asic Settings Adv	anced Settings   Serial Parameters   S	ecurity │ IPv6 Settin
🔲 Auto Enumera	ting COM Number for Selected Ports.	
COM Number	COM5 (current) (in use)	
I Enable CO		
Index	COM Number	Add COM
		Remove COM
•		
7 Help		

2. **Add COM** to select target COM ports for splitting; the COM port must be available.

Add Split COM	×
COM Number	COM30
COM Port Setting	×
Basic Settings Advanced	
Index 1 2 3 Нер	COM Number COM14 COM27 COM28 Remove COM
	OK X Cancel

3. After pressing OK, check if the COM ports you just selected are grouped together. Click Apply to save the change.

<u>F</u> ile	<u>C</u> OM Mapping Configuration ⊻iew	<u>H</u> elp			
Exi		ndo Setting			
No	COM Port	Address 1		Address 2	
1	COM1	192.168.127.254	950:966 (Port1)		
2	COM5	192.168.127.254	951:967 (Port2)		
3	COM6	192.168.127.254	952:968 (Port3)		
4	COM8	192.168.127.254	953:969 (Port4)		
5	COM9	192.168.127.101	950:966 (Port1)		
6	COM12	192.168.127.101	951:967 (Port2)		
7	COM13	192.168.127.101	952:968 (Port3)		
8	[S] COM14, COM27, COM28	192.168.127.101	953:969 (Port4)		
9	COM15	192.168.127.101	954:970 (Port5)		
10	COM16	192.168.127.101	955:971 (Port6)		
11	COM17	192.168.127.101	956:972 (Port7)		
12	COM18	192.168.127.101	957:973 (Port8)		
13	COM19	192.168.127.102	950:966 (Port1)		
14	COM20	192.168.127.102	951:967 (Port2)		
15	COM21	192.168.127.102	952:968 (Port3)		
16	COM22	192.168.127.102	953:969 (Port4)		
17	COM23	192.168.127.102	954:970 (Port5)		
18	COM24	192.168.127.102	955:971 (Port6)		
19	COM25	192.168.127.102	956:972 (Port7)		
20	COM26	192.168.127.102	957:973 (Port8)		

4. Adjust Max Connection number in the NPort's Operating Settings to match the unit's number in the COM Split Group

ΜΟΧΛ	Tota	I Solution for Industrial De	evice Networking	
<ul><li>Model</li><li>Name</li></ul>	- NPort 5430 - NP5430_4570	■ IP ■ Serial NO.	- 192.168.127.254 - 4570	= MA( = Firm
Overview Quick Setup	•	Port 1		
Basic Settings		Operation mode	RealCOM	
Network Settings		TCP alive check time	7 (0 - 99 min)	
- Serial Settings		Max connection		
- Operating Settings		Max connection		
Port 1		Ignore jammed IP	2 lo Yes	
Port 2		Allow driver control	3 4 lo Yes	
Port 3			4	
Port 4		Data Packing		
Accessible IP Settings		Data Facking		
A -111		Barrista a francista		

Click the **Advanced Setting** tab to change Tx Mode, FIFO, and Flash Flush.

COM Port Setting ×
Port Number: 1 Port(s) are Selected.
Basic Settings Advanced Settings Serial Parameters Security IPv6 Settings
Apply All Selected Ports
The FIFO settings will overwrite the firmware
setting. Tx Mode Hi-Performance ▼
FIFO Enable
Network Timeout 5000 ms (500 - 20000)
✓ Fast Flush (Flush Local Buffer Only)
Auto Network Re-Connection
Always Accept Open Requests
Drop Writing Data If Network Connection Lost
Return Error If Network Is Unavailable
☐ Ignore TX Purge
Enable Auto IP Report
MAC Address 00:90:E8:9A:DF:7F
? Help
V DK X Cancel

#### Tx Mode

**Hi-Performance** is the default for Tx mode. After the driver sends data to the NPort 5000, the driver immediately issues a "Tx Empty" response to the program. Under **Classical** mode, the driver will not send the "Tx Empty" response until after confirmation is received from the NPort 5000's serial port. This causes lower throughput. Classical mode is recommended if you want to ensure that all data is sent out before further processing.

#### FIFO

If FIFO is **Disabled**, the NPort 5000 will transmit one byte each time the Tx FIFO becomes empty, and an Rx interrupt will be generated for each incoming byte. This will cause a faster response and lower throughput.

#### **Network Timeout**

Use this option to prevent blocking if the target NPort is unavailable.

#### Fast Flush (only flushes the local buffer)

For some applications, the user's program will use the Win32 "PurgeComm()" function before it reads or writes data. After a program uses this PurgeComm() function, the NPort driver continues to query the NPort's firmware several times to make sure no data is queued in the NPort's firmware buffer, rather than just flushing the local buffer. This design is used to satisfy some special considerations. However, it may take more time (about several hundred milliseconds) than a native COM1 because of the additional time spent communicating across the Ethernet. Therefore, PurgeComm() works significantly faster with native COM ports on the PC than with mapped COM ports on the NPort 5000. In order to accommodate other applications that require a faster response time, the new NPort driver implements a new Fast Flush option. By default, this function is enabled.

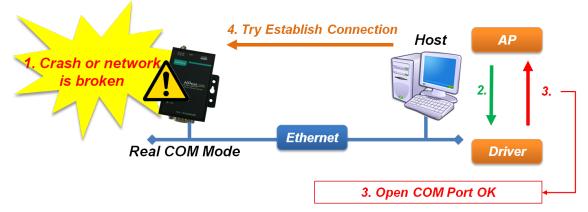
If you have disabled Fast Flush and find that COM ports mapped to the NPort 5000 perform markedly slower than when using a native COM port, try to verify if "PurgeComm()" functions are used in your application. If so, try enabling the Fast Flush function and see if there is a significant improvement in performance.

#### **Auto Network Re-Connection**

With this option enabled, the driver will repeatedly attempt to re-establish the TCP connection if the NPort 5000 does not respond to background "check-alive" packets.

#### **Always Accept Open Requests**

When the driver cannot establish a connection with the NPort, the user's software can still open the mapped COM port, just like an onboard COM port.



#### **Return Error If Network Is Unavailable**

If this option is disabled, the driver will not return any errors even when a connection cannot be established to the NPort 5000. With this option enabled, calling the Win32 Comm function will cause the error return code "STATUS\_NETWORK\_UNREACHABLE" when a connection cannot be established to the NPort 5000. This usually means that your host's network connection is down, perhaps because of a cable being disconnected. However, if you can reach other network devices, maybe the NPort 5000 is not powered on or is disconnected. Note that **Auto Network Re-Connection** must be enabled to use this function.

#### **Drop Writing Data If Network Connection Lost**

When enabled, the NPort driver will drop the writing data if the network connection between Windows and NPort device is lost. In other words, the writing data will not be sent out after the network reconnects.

#### Ignore TX Purge

Applications can use the Win32 API PurgeComm to clear the output buffer. Outstanding overlapping write operations will be terminated. Select the **Ignore TX Purge** checkbox to ignore the effect on output data.

#### ΝΟΤΕ

Starting Windows Driver Manager v1.19 supports Moxa OnCell Series; the **Enable Auto IP Report** function in the Advance setting only supports OnCell products.

The **Serial Parameters** window in the following figure shows the default settings when the NPort 5000 is powered on. However, the program can redefine the serial parameters to different values after the program opens the port via Win 32 API.

OM Port Setting			×
Port Number:	I Port(s) are Se	ected.	
Basic Settings Adva	anced Settings	Serial Parameters	Security   IPv6 Settings
🔲 Apply All Selec	ted Ports		
These options o such as serial p settings.	vill be saved on rinter driver. In g	registry and used or general cases you ca	n few applications an ignore these
Baud Rate	9600	•	
Parity	None	-	
Data Bits	8	-	
Stop Bits	1	•	
Flow Control	None	•	
<u>?</u> <u>H</u> elp			
		<b>V</b> 0	K 🗙 Cancel

#### Security (NPort 6000 and 6000-G2 models)

#### **Enable Data Encryption**

Enable the SSL encryption for data transmission of the COM port. In Redundant COM mode, the security function is not supported.

• Enable Certification Authentication:

"Enable Certification Authentication" is a security enhancement that provides you a mechanism to check if the Certificate Authority (CA) has certified an imported certificate.

#### **Keep Connection**

If your COM port, with data encryption enabled, will be opened/closed frequently, and the NPort is used by only one host, it is recommended to enable this option for quicker operations. A COM port with encryption enabled will take a short time(300 to 500 ms) while opening because of the SSL protocol. By enabling these options, the COM port connection (SSL) will always be kept connected. Here, opening/closing the COM port will be quicker. In Reverse Real COM mode, the "Keep Connection" is not supported.

		Advanced Settings	Serial Parameters	Security	IPv6 Setting
No	cate I	File Name	Issue by	Expired	date
<			Import	De	> lete
		Selected Ports			
		e Data Encryption hable Certificate Authe	entication		
	Кеер	Connection			
In F	ledun	dant COM mode, the	security function is r	iot support	ed.
	evers	e Real COM mode, "I	Keep Connection" is	not suppor	rted.

#### IPv6 Settings (NPort 6000 and 6000-G2 models)

#### Interface Index

The Interface Index is for Link-Local address mapping only. Ignore the setting if the mapping address is not a Link-Local(e.g., fe80: 0/64) one. If the COM port is mapped with a link local address, the interface index must be assigned for routing issues. This setting is used to tell the windows system which interface the data should be routed to.

# NOTE

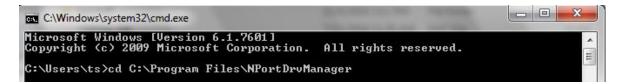
Security and IPv6 Settings are supporting NPort 6000 and 6000-G2 models only.

# **Command-line Installation/Removal**

For NPort Windows Driver Manager v1.19 and above, it comes with command-line script tool – **npcli.exe** for installation, removal of the driver and capability of configuring NPort driver functions.

After successfully installing NPort Windows Driver Manager v1.19 (or above), the default file path is **C:\Program Files\NPortDrvManager** as shown below. The main files that support the NPort command-line tool are **npcli.exe** and **GIdMap.dat**. You may move these two files to your preferred location.

Once NPort Windows Driver Manager v1.19 (or later) is installed, call out *cmd* screen on your computer. Change the directory to the location where these two files are installed.



Type **npcli** /? to get detailed information of what command lines are supported and the function descriptions.

C:\Windows\system32\cmd.exe	
Microsoft Windows [Version 6.1.7601] Copyright (c) 2009 Microsoft Corporation. All rights reserved.	* 
C:\Users\ts>cd C:\Program Files\NPortDrvManager	
C:\Program Files\NPortDrvManager>npcli /?	

The usage instructions will show up as below for user's reference:

```
_____
NPort Command-line Interface Ver2.0 Build 16052400
_____
NPort Command-line Interface allows user to manage Real COM port in command
mode.
 It offers these features.
   - Install, remove, or upgrade NPort Driver Manager without entering user
interface.
   - Assign or manage Real COM port with serial parameters.
   - Search NPorts and change some network configurations.
                                            _____
_____
_____
 1. NPort Driver Manager installation and management
    User may copy npcli.exe to a repository to use following commands.
    Usage: npcli /driver [[/install | /upgrade] PATH_NAME] | [/uninstall]
 Parameters are described below:
              This command is related to driver.
    /driver
 /install
            Install specified driver to host.
 /uninstall Uninstall current installed driver from host.
            Upgrade specified driver without modify the mapped ports.
 /upgrade
 PATH NAME
             Specify the installer file of NPort Driver Manager to install
             or upgrade.
    Examples:
     Install a specified NPort Driver Manager.
     >npcli /driver /install
D:\Users\drvmgr setup Ver1.19.0 Build 15122492.exe
     Remove NPort Driver Manager from system.
     >npcli /driver /uninstall
_____
 2. Real COM port management
    These features require the NPort Driver Manager installed. User may change
the port
    settings without using NPort Driver Manager utility.
    Usage:
      - npcli /driver /add IP ADDR /port PORT NO /com COM NO [/txmode [hiperf |
        classical]] [/fifo [enable | disable]] [/flush [fast | normal]]
      - npcli /driver /remove /com [COM NO | all]
      - npcli /driver /list
      - npcli /driver /set /com [COM NO] /ip [IP ADDR]
```

```
Parameters are described below:
    /driver
                 This command is related to driver.
             Add a RealCOM with a valid IP address (IP ADDR).
 /add
 /port
             Specify the NPort port number (PORT NO) to add.
                Specify the COM number to add/set or remove (COM NO).
    /com
 /txmode
             Set the TX mode as hi-performance (hiperf) or classical. The
              default is hiperf.
 /fifo
              Set the FIFO as enable or disable. The default is enable.
              Set to enable fast flush(fast) or disable fast flush(normal).
 /flush
              The default is fast.
 /remove
              Remove specified COM number (COM NO) or all RealCOM ports.
    /list
                 Show the current Real COM ports
    /set
                 Change the parameter of specified (COM NO)
                  Specify the IP address (IP ADDR) to change.
    /ip
    Examples:
     Create a Real COM port COM3 for Port1 of NPort(192.168.127.254).
      >npcli /driver /add 192.168.127.254 /port 1 /com 3
     Create a Real COM port COM4 on the same NPort with FIFO disable.
      >npcli /driver /add 192.168.127.254 /port 2 /com 4 /fifo disable
     List current Real COM ports
      >npcli /driver /list
                             950
      COM3 192.168.127.254
                                     966
                                              Port1
      COM4
           192.168.127.254 951
                                     967
                                             Port2
     Change IP address to 192.168.0.112 for Read COM port COM4
      >npcli /driver /set /com 4 /ip 192.168.0.112
     Remove COM3 from system
      >npcli /driver /remove /com 3
     Remove all COM ports from system
      >npcli /driver /remove /com all
 _____
 3. NPort device configuration
    User may copy npcli.exe and GIdMap.dat together to a repository to use
following
    commands.
    Usage:
      - npcli /devicd /search
      - npcli /device /set ID /network [/ip IP ADDR] [/mask SUBNET]
         [/gateway IP ADDR] [/username NAME] [/password CIPHER]
      - npcli /device /apply ID [/username NAME] [/password CIPHER]
 Parameters are described below:
    /device
                This command is related to NPort.
             Search the NPort and store the list to the memory.
 /search
               Specify the ID to set. Users must specify one of the searched
 /set
               NPorts for further operations. The default is 1.
               Specify the NPort port number (PORT NO) to set.
 /port
               Specify the login username (NAME) if the NPort has one.
 /username
 /password
               Specify the password (CIPHER) if the NPort has one.
 /network
             Set to change the network settings.
```

```
Change the IP address (IP ADDR) of NPort.
  /ip
  /mask
               Change the subnet mask (SUBNET) of NPort.
               Change the IP address (IP ADDR) of gateway.
  /gateway
  /apply
               Specify the ID to save changes and restart the NPort.
    Examples:
     Search NPorts in LAN. Following example shows 2 NPorts are found. The
first
     column is unique IDs which will be used for other commands.
      >npcli /device /search
      1
              192.168.0.112
                              0090e84843e3
                                             NPort 6650-32
      2
              192.168.0.162
                              0090e8f673e1
                                             NPort 6610-16
     Change the IP of NPort 6610-16 from 192.168.0.162 to 192.168.0.188. For
some
     NPorts the username and password is required to access the configuration.
      >npcli /device /set 2 /network /ip 192.168.0.188 /username admin
/password moxa
     Apply above setting to that NPort.
      >npcli /device /apply 2 /username admin /password moxa
          _____
                                                         _____
Note:
 Npcli.exe requires an administrator privilege to change device settings.
 It support only IPv4 and it must be run under Windows XP and later versions.
```

# **Port Sniffer Wizard**

A port sniffer is a utility that monitors and captures all serial ports activity on a system. It has advanced filtering and search capabilities that make it a powerful tool for exploring the way Windows works, seeing how applications use ports, or tracking down problems in system or application configurations.

#### How to Use a Port Sniffer

Click **Port Sniffer Wizard** in the drop-down menu under Help.

🐝 NP	ort Windows	Driver Manager			-	$\times$
<u> </u>	<u>C</u> OM Mapping	Configuration View	Help			
Ēxi	t Add		🤣 Online Help			
No	COM Port	Remove Apply U	Port Sniffer Wizard About	Address 2		 
1 2	COM11 COM12	· · · · · · · · · · · · · · · · · · ·	192.168.127.254 950.966 (Port 192.168.127.254 951:967 (Port	1)		
Total C	OM Port - 2					//

#### Task Page

Select the task you need and click **Next**:

- Capture serial data logs
- Monitor runtime serial data (for developers)
- Display existing settings
- Delete existing settings

Moxa Port Sniffer	×
Select your task	
• Capture serial data logs	
O Monitor runtime serial data (for developers)	
O Display existing settings	
O Delete existing settings	
Click Next, select COM ports to capture serial logs.	
< Back Next > Cancel	

#### **Capture Serial Data Logs**

If errors occur, you can capture serial data logs from specific ports and send them back to Moxa. We can help you check the problems. Select this function to export log files.

-	

### NOTE

Enabling capture serial data log function may cause slight latency.

#### Step 1: COM port setting

- > Select one or more COM ports to capture.
- > Turn on the function you need.
  - Display IRP direction

IRP will inform users whether the error occurs when issuing a command or returning a response.

Hide sensitive data

The system will hide the data, so that you don't need to worry about data leakage. This is specifically used for sensitive data.

Port Sniffer  Select COM ports to capture  COM Number  COM5  COM6  COM7  COM7  COM8  COM11  COM12  COM12 COM12 COM	<ul> <li>✓ Display IRP direction</li> <li>✓ Log to file</li> <li>✓ Hide sensitive data</li> <li>Refresh</li> </ul>	×
Click Next, set the parameters of le Click Back, return to the task page		cel

Step 2: Set the parameters of logging files

Enabled log service.

# •

#### NOTE

Disable the log service will not capture the serial data.

- Choose the location of log files.
- > Set the max. number of log files and max. file size (MB).

Port Sniffer ×
Set the attribute of logging file
Log Service : ENABLED ~
Location of log files : C: \mxportsf
Max. number of log files : 10
Max. file size (MB) : 30
Click Finish, Sniffer will start/stop to log serial data in the background. Click Back, return to check the COM port settings.
< Back Finish Cancel

> Click finish and check log files at the locations you set.

#### Monitor Runtime Serial Data (for developers)

In comparison with the "Capture serial data logs" function, the "Monitor runtime serial data" function presents the status in real-time.

## NOTE

Usually used by developers or serial driver programmers to troubleshoot.



### NOTE

Download some debug tools like "DebugView" from a third party to view the real-time status.

Step 3: COM port setting

- > Select one or more COM ports to monitor the serial log in runtime.
- > Turn on the function you need.
  - Display IRP direction
    - IRP will inform users whether an error occurs when issuing a command or returning a response.
    - Log to file
      - Export log files simultaneously.

#### NOTE

Export log files simultaneously will cause latency.

Hide sensitive data

The system will hide the data. This is specifically used for sensitive data.

Port Sniffer	×
Select COM ports to capture	Display IRP direction     Log to file     Hide sensitive data     Refresh
Click Next, set the parameters of logg Click Back, return to the task page.	ging files.
	< <u>B</u> ack <u>N</u> ext > Cancel

# NOTE

Skip step 2 if you disable Log to file function.

- Enable log service.
- $\succ$  Choose the location of log files.
- > Set the max. number of log files and max. file size (MB).

Port S	niffer	:	×	
Se	t the attribute of logging file			
	Log Service :	ENABLED ~		
	Location of log files :	✓ C: \mxportsf		
	Max. number of log files :	10		
	Max. file size (MB) :	30		
Click Finish, Sniffer will start/stop to log serial data in the background. Click Back, return to check the COM port settings.				
		< Back Finish Cancel		

**Step 5:** Set the environment settings.

Enable the Debug Print Filter to dump messages from the kernel. The setting will take effect after the system restarts.

### NOTE

Disable the Debug Print Filter will not output the serial data on the monitor.

## NOTE

You can see the runtime serial data from the debug output monitor.

Port Sniffer ×			
Environment settings Sniffer Service : ENABLED Debug Print Filter : ENABLED Note: ENABLED ITSABLED IN Windows Vista or later versions, you must enable the Debug Print Filter to dump messages from kernel. This setting will take effect after system restart. Then, you can see the run-time serial data from the debug output monitor, like DebugView. (DebugView is an application distributed by Sysinternals ®)			
Click Finish, Sniffer will enable the service and apply the filter. Then, the sniffer will output serial data to the debug monitor. Click Back, return to check the COM port settings.			
< Back Finish Cancel			

> Click **Finish** and open "DebugView" to Monitor runtime serial data.

	View on \\JASONCHEN-N		×
	Capture Options Cor		
🖻 🖬 🕷	🍳   🤮 🏞   🛤		
#	Time	Debug Print	
	0.00000000		
2	0.00000310	Moxa Port Sniffer Driver is loaded successfully	
3	0.00000490	Build Info: Ver1.7 Build 22101315	
1	0.00001000		
2	17.17764664 17.17768288	mxportsf, 1, MOXA UPort COM Port 1 (COM44), IRP_MI_CREATE, STATUS SUCCESS	
2	17.17769814	mxportsf, 2, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_BAUD_RATE, STATUS_SUCCESS, Band Rate: 1200 mxportsf, 3, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_LINE_CONTROL, STATUS_SUCCESS, 7-NONE-1	
2	17.17771149	mxpotist, J, MOXA UPOLCOM Fort I COMM4), IOCL_SBRIAL_OBT_LINE_COM, STATUS_SOCCESS, FAVAR-1 mxpotist, J, MOXA UPOLCOM Fort I (COMM4), IOCL_SBRIAL_OBT_CHARS, STATUS_SOCCESS, DFA0EV0 XON:17 XOFF:19	
ś	17.17772865	mxports, 5, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_HANDFLOW, STATUS_SUCCESS, Handbakes0x00000001 FlowReplace60x00000000 XonLimit64 XoffLimit16	
io	17.17774582	mxportsf, 6, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_SET_TIMEOUTS, STATUS_SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:0	- 1
11	17.17775917	mxportsf, 7, MOXA UPort COM Port 1 (COM44), IOCTL SERIAL GET BAUD RATE, STATUS SUCCESS, Baud Rate: 1200	
12 13	17.1777252	mxportsf, 8, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_LINE_CONTROL, STATUS_SUCCESS, 7-NONE-1	
13	17.17778587	mxportsf, 9, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_CHARS, STATUS_SUCCESS, EOF:0 BR:0 EV:0 XON:17 XOFF:19	
4	17.17779922	mxportsf, 10, MOXA UPort COM Port 1 (COM44), IOCTL SERIAL GET HANDFLOW, STATUS SUCCESS, Handshake:0x00000001 FlowReplace:0x00000000 XonLimits64 XoffLimits16	
15	17.17796898	mxportsf, 11, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_SET_BAUD_RATE, STATUS_SUCCESS, Baud Rate: 38400	
16 17	17.17805672 17.17813683	mxportsf, 12, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_SET_RTS, STATUS_SUCCESS mxportsf, 13, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_SET_DTR, STATUS_SUCCESS	
18	17.17829514	mxpotist, IS, MOAA Oron COM Fort I (COM44), ICCL SBRIAL SBL JOIR, STATUS SUCCESS	
19	17.17845154	mxpotst, 14, MOXA OF MICONT COM POLICOM449, IOCTL_SERIAL_SET_CHARS, STATUS_SOCCESS_BOF:0.08407, 10001017	
20	17.17846489	mxportst, 16, MOXA UP of COM Port 1 (COM44), IOCTL_SERIAL_SET_HANDFLOW, STATUS_SUCCESS, Handshake0x00000001 FlowReplaces0x80000040 XonLimit64 XoffLimit16	
21	17.17847633	mxportsf, 17, MOXA UPort COM Port 1 (COM44), 0x001b2000, STATUS SUCCESS	
2	17.17848778	mxportsf, 18, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_TIMEOUTS, STATUS_SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:0	
23	17.17849922	mxportsf, 19, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_SET_TIMEOUTS, STATUS_SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:100	
24	17.17851830	mxportsf, 20, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_BAUD_RATE, STATUS_SUCCESS, Baud Rate: 38400	
<			>

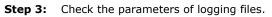
### **Display existing settings**

**Step 1:** Click **Display existing settings** to view the current setting.

Moxa Port Sniffer	×
Select your task	
○ Capture serial data logs	
O Monitor runtime serial data (for developers)	
Display existing settings	
O Delete existing settings	
Click Next, view the current settings	
< Back Next > Cancel	

**Step 2:** Check the COM port settings.

Port Sniffer		×
Select COM ports to capture	Display IRP direction Log to file Hide sensitive data Refresh	
Click Next, check the parameters of Click Back, return to the task page.		1



Port Sniffer	×
Set the attribute of logging file	
Log Service :	ENABLED
Location of log files :	✓ C: \mxportsf
Max. number of log files :	10
Max. file size (MB) :	30
Click Next, check the environme	nt settings.
Click Back, return to check the C	COM port settings.
	< <u>B</u> ack <u>N</u> ext > Cancel

**Step 4:** Check the environment settings.

Port Sniffer	~
Environment settings Sniffer Service : ENABLED Debug Print Filter : ENABLED Note: In Windows Vista or later versions, you must enable the Debug Print Filter to dump messages from kernel. This setting will take effect after system restart. Then, you can see the run-time serial data from the debug output monitor, like DebugView. (DebugView is an application distributed by Sysinternals ®)	
Click Finish, finish Port Sniffer settings. Click Back, return to check the COM port settings.	
< Back Finish Cancel	

**Step 5:** Click **Finish** to finish the port sniffer settings.

#### Delete existing settings

**Step 1:** Select **Delete existing settings**.

Moxa Port Sniffer	$\times$
Select your task	
Capture serial data logs	
O Monitor runtime serial data (for developers)	
O Display existing settings	
Delete existing settings	
Click Finish, delete all COM ports to capture or monitor.	
< Back Finish Cancel	

**Step 2:** Click **Finish** to delete existing settings.

# **Basic Procedures**

To map an NPort 5000 serial port to a Linux host's tty port, follow these instructions:

- Set up the NPort 5000. After verifying that the IP configuration works and you can access the NPort 5000 (by using ping, telnet, etc.), configure the desired serial port on the NPort 5000 to Real COM mode.
- 2. Install the Linux Real tty driver files on the host
- 3. Map the NPort serial port to the host's tty port

# **Hardware Setup**

Before proceeding with the software installation, make sure you have completed the hardware installation. Note that the default IP address for the NPort 5000 is 192.168.127.254.



### NOTE

After installing the hardware, you must configure the operating mode of the serial port on your NPort 5000 to Real COM mode.

# **Installing Linux Real TTY Driver Files**



#### NOTE

The newest information, refer to readme.txt on Linux Real TTY Driver

- 1. Obtain the driver file from Moxa's website, at <a href="http://www.moxa.com">http://www.moxa.com</a>. You may find it in the **Resource** section under your product page.
- 2. Log in to the console as a superuser (root).
- 3. Execute cd / to go to the root directory.
- 4. Copy the driver file npreal2xx.tgz to the / directory.
- 5. Execute tar xvfz npreal2xx.tgz to extract all files into the system.
- 6. Execute /tmp/moxa/mxinst.

For RedHat AS/ES/WS and Fedora Core1, append an extra argument as follows:

# /tmp/moxa/mxinst SP1

The shell script will install the driver files automatically.

- 7. After installing the driver, you will be able to see several files in the /usr/lib/npreal2/driver folder:
  - > mxaddsvr (Add Server, mapping tty port)
  - > mxdelsvr (Delete Server, unmapping tty port)
  - > mxloadsvr (Reload Server)
  - > mxmknod (Create device node/tty port)
  - > mxrmnod (Remove device node/tty port)
  - > mxuninst (Remove tty port and driver files)

At this point, you will be ready to map the NPort serial port to the system tty port.

# **Mapping TTY Ports**

Make sure that you set the operation mode of the desired NPort 5000 serial port to Real COM mode. After logging in as a superuser, enter the directory /usr/lib/npreal2/driver and then execute mxaddsvr to map the target NPort serial port to the host tty ports. The syntax of mxaddsvr is as follows:

mxaddsvr [NPort IP Address] [Total Ports] ([Data port] [Cmd port])

The mxaddsvr command performs the following actions:

- 1. Changes npreal2d.cf.
- 2. Creates tty ports in directory /dev with major & minor number configured in npreal2d.cf.
- 3. Restarts the driver.

# Mapping tty ports automatically

To map tty ports automatically, you may execute mxaddsvr with just the IP address and the number of ports, as in the following example:

# cd /usr/lib/npreal2/driver

# ./mxaddsvr 192.168.3.4 16

In this example, 16 tty ports will be added, all with IP 192.168.3.4, with data ports from 950 to 965 and command ports from 966 to 981.

# Mapping tty ports manually

To map tty ports manually, you may execute mxaddsvr and manually specify the data and command ports, as in the following example:

# cd /usr/lib/npreal2/driver

# ./mxaddsvr 192.168.3.4 16 4001 966

In this example, 16 tty ports will be added, all with IP 192.168.3.4, with data ports from 4001 to 4016 and command ports from 966 to 981.

# **Removing Mapped TTY Ports**

After logging in as root, enter the directory /usr/lib/npreal2/driver and then execute mxdelsvr to delete a server. The syntax of mxdelsvr is:

mxdelsvr [IP Address]

Example:

# cd /usr/lib/npreal2/driver
# ./mxdelsvr 192.168.3.4

The following actions are performed when executing mxdelsvr:

- 1. Modify npreal2d.cf.
- 2. Remove the relevant tty ports in directory /dev.
- 3. Restart the driver.

If the IP address is not provided in the command line, the program will list the installed servers and total ports on the screen. You will need to choose a server from the list for deletion.

# **Removing Linux Driver Files**

A utility is included that will remove all driver files, mapped tty ports, and unload the driver. To do this, you only need to enter the directory /usr/lib/npreal2/driver, then execute mxuninst to uninstall the driver. This program will perform the following actions:

- 1. Unload the driver.
- 2. Delete all files and directories in /usr/lib/npreal2
- 3. Delete directory /usr/lib/npreal2
- 4. Modify the system initializing script file.

# Introduction

This section is intended for programmers who are porting the NPort Real TTY driver to a specified Armbased platform. The following knowledge is recommended before reading the instructions in this guide.

- Linux kernel programming
- Arm platform compiler
- The Yocto Project documentation
- Moxa UC-Series Manual
- Raspberry Pi Manual

Instructions in this section use examples of porting on the Moxa UC-Series Arm platform and Raspberry Pi. You can apply the experience of porting Real TTY driver to other platforms.

The Real TTY driver fully supports all modern-day Linux distributions running on x86 environments, and the driver core is also compatible with the Arm platform. This document will guide you on how to port the Real TTY driver core.

However, some platform-dependent services, such as installer, are not available. You may refer to the platform's documentation to fulfill the requirements.

# Porting to the Moxa UC-Series—Arm-based Computer

# **Build Binaries on a General Arm Platform**

If your platform is powerful and comprises the necessary development tools, the driver can be built on the platform directly. You can refer to README.TXT of Real TTY Driver to understand the requirement.

The step of building this driver in an Arm environment is the same as in x86 and x64 environments.

# ./mxinst

# **Cross-compiler and the Real TTY Driver**

#### NOTE

To cross-compile on a x86 or x64 Linux host, the target ARM environment's kernel source package and cross compiler toolchain must be installed first.

After installing and configuring the kernel source package and toolchain, you need to compile all of the source code with the kernel source package and toolchain.

In this example, we install the cross-compiler for the Moxa UC-Series ARM-based computer. You can refer to the product's manual for further detail.

- Download the cross-compiler toolchain and the kernel source package webpage under the product page.
   \$ git clone https://github.com/Moxa-Linux/am335x-linux-4.4
- 2. Download the toolchain from the product's webpage. The toolchain, which is used by the UC Series, is arm-linux-gnueabihf. It is a script that will install the related packages. Execute the script and follow the steps to install the Linux cross-compiler tools. You will need the root privilege to install the toolchain and the kernel source.

# sh arm-linux-gnueabihf\_6.3\_Build\_amd64\_<build\_date>.sh

If the script shows the notification message: "Please export these environment variables before using toolchain", enter the following script command:

# export PATH=\$PATH:/usr/local/arm-linux-gnueabihf-6.3/usr/bin

3. The kernel source, which is used by the UC Series, is am335x-linux-4.4. You need to configure these files before cross-compiling.

Move the kernel source to /moxa/kernel and configure the kernel source.

- # mv am335x-linuc-4.4 /moxa/kernel
- # cd /moxa/kernel
- # make uc3100 defconfig ← Replace the UC 3100 with the UC Series that is being used.
- # make modules\_prepare

After the abovementioned steps, follow the processes as set out in Section "Moxa cross-compiling interactive script," and Section "Manually build the Real TTY driver with a cross-compiler," to cross-compile Moxa's driver for the UC-Series platforms.

The NPort Real TTY driver, which includes the driver module, service daemons, and tools, needs to be compiled. The files are listed as follows:

- npreal2.ko: Real TTY kernel extension
- npreal2d: Daemon of Real COM communication
- npreal2d\_redund: Daemon of Redundant COM mode only for the NPort CN2500/CN2600 Series.
- mxloadsvr: Daemons reloading tool.
- mxaddsvr: Port-mapping tool.
- mxdelsvr: Port-unmapping tool.
- mxsetsec: Secure mode setting tool.
- mxcfmat: Internal-use only tool.
- mxmknod: Internal-use only tool.
- mxrmnod: Internal-use only tool.
- npreal2d.cf: Configuration template.

If it is preferred to build these binaries with automatic script, refer to the section "Moxa cross-compiling interactive script." If you find the build script troublesome, or you prefer to build these binaries manually, refer to the section "Manually build the Real TTY driver with a cross-compiler."

If you have generated the necessary binaries, refer to Section "Deploy cross-compiled binary to target" to deploy to the target platform.

### Moxa cross-compiling Interactive Script

To simplify the processes above, Moxa has provided an interactive script, "mxcc", to cross-compile these drivers. You may execute ./mxcc in the Real TTY driver source directory to cross-compile the Moxa driver.

The steps are as follows:

```
# ./mxcc
Enter target device architecture (ARCH) [arm]:
Enter cross-compiler (CROSS COMPILE) [arm-linux-gnueabihf-]:
Enter target device kernel source directory [/moxa/kernel/]:
If you wish to use secure communication with the NPort 6000 Series device, choose
[Y] to enable the SSL function.
Note: This function supports Real COM with secure mode in the NPort 6000 Series
onlv.
Do you want to enable secure mode? [Y/N]: N
The polling mode allows you to open the tty port as nonblocking even if the NPort
is not connected.
Do you want to set the driver to polling mode? [Y/N]: N
Moxa NPort Server Real TTY Driver Series driver cross-compiling finished.
When cross compiling is successful, the driver is outputted to output folder.
```

The binaries will now be generated and placed in the output directory under the source code folder.

# Manually Build the Real TTY Driver With a Cross-compiler

# To cross-compile npreal2 driver, users can find "Makefile" in the driver source folder, then run it.

# make -C KDIR=<KERNEL\_SOURCE> M=<DRIVER\_SOURCE> ARCH=<ARCH>
CROSS\_COMPILE=<CROSS\_COMPILE> KVER\_MAJOR=<KERNEL\_MAJOR>
KVER MINOR=<KERNEL MINOR> modules

<KERNEL\_SOURCE>: The directory of target kernel source.

<DRIVER\_SOURCE>: The directory of the Real TTY driver source.

<ARCH>: The target Arm environment device's CPU architecture. For example, arm, arm64.

<CROSS\_COMPILE>: The cross-compile toolchain path. If the toolchain is arm-linux-gnueabihf, and the path of toolchain exists in your PATH environment variable, enter "arm-linux-gnueabihf-" here.

<KERNEL\_MAJOR>: The target Arm system kernel source's kernel major version. You can use the command "make kernelversion" to get the kernel source's major version.

```
For example:
# make kernelversion
4.4.0
|
+--- kernel major version
```

<KERNEL\_MINOR>: The target Arm system kernel source's kernel minor version. You can use the command "make kernelversion" to get the kernel source's minor version.

```
For example:
$ make kernelversion
4.4.0
|
+--- kernel minor version
```

The "make" command would be similar to the following example:

# make -C KDIR=/moxa/kernel M=/home/user/moxa/source ARCH=arm CROSS\_COMPILE=armlinux-gnueabihf- KVER MAJOR=4 KVER MINOR=4 modules

After using the "make" command to cross-compile the drivers, the driver file "npreal2.ko" can be found in the source code directory.

# To cross-compile the daemons and tools, find "Makefile" in the driver source folder, then run it.

# make <TARGET> CROSS\_COMPILE=<CROSS\_COMPILE> CC=<C\_COMPILE> CFLAGS=<C\_FLAGS>

<TARGET>: Set one of npreal2d, preal2d\_redund, and tools.

<CROSS\_COMPILE>: The cross-compile toolchain path. If the toolchain is "arm-linux-gnueabihf", and the path of toolchain exists in your PATH environment variable, enter "arm-linux-gnueabihf-" here.

<C\_COMPILE>: The C compiler offered by the cross-compiler toolchain. It is "gcc" if the toolchain is "arm-linux-gnueabihf-".

<C\_FLAGS>: Specify the preprocessor definitions of Real TTY driver here.

NOTE

"-DNO\_INIT" must be included or else the cross-compiler may return error messages.

See the definitions:

- "-DNO\_INIT": Disable the startup service.
- "-DOFFLINE\_POLLING": Allow tty not to be blocked if the NPort is offline.

e.g.: To build TARGET=npreal2d with a polling feature, use the following command:

# make npreal2d CROSS\_COMPILE="arm-linux-gnueabihf-" CC=gcc CFLAGS="-DNO\_INIT -DOFFLINE POLLING"

After using the "make" command to cross compile the daemons and tools, the binaries can be found in the source code directory.

#### (Optional) Build a secure mode connection to the NPort 6000 Series

When it is required to use a secure mode connection to the NPort 6000 Series, the npreal2d daemon should be built manually because it needs an extra OpenSSL library. This section introduces the secure mode npreal2d building besides the OpenSSL library demonstration. OpenSSL is maintained by <u>www.openssl.org</u>.

Most of the Linux distributions have package management tools, such as apt-get or yum, which help you install OpenSSL library and development tools. In an Arm platform, it has to be built from the source code. You may refer to OpenSSL's user guide to generate the library first. The instructions may vary amongst different OpenSSL versions, cross-compilers, or building hosts.

The demonstration here illustrates the process that Moxa has built for the library for Real TTY driver and for the Moxa's lab testing.

1. Create the folders below for OpenSSL products:

```
$ cd ~
$ mkdir openssl-lib
$ cd openssl-lib
$ mkdir openssl-arm
$ mkdir ssl-arm
```

2. Check out the OpenSSL source code. We used a stable branch named OpenSSL-fips-2\_0\_9. The command below will download the OpenSSL-fips-2\_0\_9 source code in the openssl folder.

\$ git clone https://github.com/openssl/openssl.git -b OpenSSL-fips-2\_0\_9

3. The OpenSSL needs to be configured before executing the "make" command.

#### NOTE

The <openssl-arm> and <ssl-arm> are the folders that were created in the previous instruction. The cross-compiler toolchain "arm-linux-gnueabihf-" is used for the Moxa UC-serial computer.

```
$ cd openssl
$ setarch i386 ./config no-asm no-shared enable-ssl3 enable-ssl3-method
enable-tls1_3 --prefix=<openssl-arm> --openssldir=<ssl-arm> --cross-compile-
prefix=arm-linux-gnueabihf-
```

4. Next, make and install the OpenSSL:

\$ make
\$ make install sw

Finally, the headers and libraries will be constructed in the following hierarchy:

#### openssl-arm

—— bin	
—— incluc	le
—— lib	
	engines
	libcrypto.a
	libssl.a
L	pkgconfig

The following command is to build npreal2d with secure mode:

\$ arm-linux-gnueabihf-gcc -c \${CFLAGS} -DNO\_INIT -DSSL\_ON -DOPENSSL\_NO\_KRB5 npreal2d.c -I/home/user/openssl-lib/openssl-arm/include

If polling mode is preferred, change "\${CFLAGS}" to "-DOFFLINE\_POLLING".

```
$ arm-linux-gnueabihf-gcc npreal2d.o -o npreal2d -lssl -lcrypto -ldl -lpthread -
L/home/user/openssl-lib/openssl-arm/lib/ -I/home/user/openssl-lib/openssl-
arm/include
```

The npreal2d binary will be generated.

Real TTY driver with a cross-compiler".

**NOTE** Only the npreal2d requires OpenSSL library; other binaries should follow the section "Manually build the



#### NOTE

The secure mode is supported only if the NPort 6000 enables it. Refer to the NPort 6000 Series User Manual to configure secure mode in the NPort 6000.

### **Deploy Cross-compiled Binary to Target**

You should find the following binaries under the output or source code directory:

- npreal2.ko
- npreal2d
- npreal2d\_redund
- mxloadsvr
- mxaddsvr
- mxdelsvr
- mxsetsec

A few necessary tools are available in the source code directory:

- mxcfmat
- mxmknod
- mxrmnod
- npreal2d.cf

Follow the steps below to deploy to the target Arm platform.

- 1. Copy the npreal2.ko to the path /lib/modules/`uname -r`/kernel/drivers/char on the Arm platform.
- 2. Create a folder /usr/lib/npreal2/driver. Copy all the above files to that folder, except npreal2.ko.
- 3. Boot into the Arm platform and load the driver.
  - # modprobe npreal2
- 4. Change the directory to "/usr/lib/npreal2/driver" and run "mxaddsvr, mxdelsvr, or mxsetsec", the same as running them on x86 Linux.
- 5. The module can be unloaded by the following command: # modprobe -r npreal2

### **Porting to Raspberry Pi OS**

Raspberry Pi OS images are prebuilt by <u>www.raspberrypi.org</u>. You can install the image and start up the system. The process to build the Real TTY driver is the same as with x86 Linux. Refer to README.txt to check the system requirements.

You may use the rpi-source to install the kernel source packages for a more convenient option. Refer to the official website <a href="https://github.com/notro/rpi-source/wiki">https://github.com/notro/rpi-source/wiki</a> for more information.

rpi-source is a third-party package offering an integrated kernel resource for building a driver. The Real TTY is tested with this package to see if it works well. However, the requirements may vary for different Raspberry Pi OS versions. Read the manual of the rpi-source to understand the know-how and the limitations.

### Porting to the Yocto Project on Raspberry Pi

#### Prerequisite

You are expected to be familiar with the Yocto Project. Refer to <u>https://docs.yoctoproject.org</u> for the Yocto Project documentation for further understanding. Also, it is encouraged to follow the procedures in this guide unless you have sufficient knowledge about the Real TTY driver, the Yocto Project, and Raspberry Pi.

The dunfell branch (3.1.9) is referred to throughout in this section. Base it on this version before reading the instructions in the Yocto Project documentation. You are required to build the Yocto image successfully with the "Yocto Project Quick Build" document.

In the Yocto Project, you can select the platform you want to build. This guide installs Raspberry Pi BSP Layer as a demonstration in the following steps:

1. Suppose the Yocto Project is installed in the /home/user/poky folder. Checkout the source code of the Raspberry Pi BSP Layer.

```
$ cd /home/user/poky
$ git clone https://git.yoctoproject.org/cgit/cgit.cgi/meta-raspberrypi -b
dunfell
```

 A meta-raspberrypi folder will be checked out now. Use the following instructions to set up Raspberry Pi BSP:

```
$ source oe-init-build-env
```

- 3. Use a text editor to add the following content to the configuration file './conf/local.conf'.
- Add the type 'rpi-sdimg' optionally if SD card is preferred IMAGE\_FSTYPES="tar.bz2 ext3 rpi-sdimg"
- 5. Change the machine name of your target
  - # Use raspberrypi2 for Pi 2 board# Use raspberrypi3 for Pi 3 board
  - Use raspberrypi3-64 for 64-bit Pi 3 board

MACHINE ?= "raspberrypi3"

- 6. Use the text editor to add the following content to the configuration file './conf/bblayers.conf'
- 7. Add this line '/home/user/poky/meta-raspberrypi' to BBLAYERS

```
BBLAYERS ?= " \setminus
```

/home/user/poky/meta \

/home/user/poky/meta-poky \

/home/user/poky/meta-yocto-bsp \

/home/user/poky/meta-raspberrypi \

- "
- 8. Build the target core-image-base by following this command and the Raspberry Pi image will be generated:

```
$ bitbake core-image-base
```

Once the above image runs on Raspberry Pi, go to the next section.

#### **Create a Moxa Layer for the Yocto Project**

#### Introduction

Moxa RealTTY driver is packaged as a layer for Yocto. You can add or remove the driver by modifying the BBLAYERS attribute in the bblayers.conf file.

The following sections describe how to create the meta-moxa layer for the dunfell branch (3.1.9). Note that the process may vary if your target uses a different branch. Refer to Yocto's manual for complete information.

An example is also available in the examples folder in the RealTTY driver.

You may follow the subsequent procedures to create the same meta-moxa layer.

#### Create an empty Moxa Layer

Use the following commands to create an empty layer, named meta-moxa.

- 1. Start the environment first. Suppose the project is installed in /home/user/poky.
  - \$ cd /home/user/poky
  - \$ source oe-init-build-env
- 2. The above commands changed the directory to the built directory. Now, we change the directory back to the Yocto root directory.

\$ cd /home/user/poky

3. Create meta-moxa:

A message appears reminding you to add the layer later.

\$ bitbake-layers create-layer meta-moxa

```
Note: Starting bitbake server.
```

Add your new layer with "bitbake-layers add-layer meta-moxa."

The meta-moxa directory will be created in /home/user/poky:

```
$ tree meta-moxa
```

#### meta-moxa

—— conf
layer.conf
COPYING.MIT
README
recipes-example
example
example_0.1.bb

The "recipes-example" folder is not necessary; it may be deleted at anytime.

#### Create a recipe for the Real TTY kernel

Use the following commands to create a recipe for installing Real TTY kernel to the target platform.

1. Create a directory recipes-kernel in meta-moxa:

- \$ cd /home/user/poky
- \$ mkdir meta-moxa/recipes-kernel
- The simplest way is to copy and modify from a hello example, which is available in the Yocto source code:

```
$ cp -r ./meta-skeleton/recipes-kernel/hello-mod ./meta-
```

moxa/recipes-kernel

The content of meta-moxa now is listed below:

\$ tree meta-moxa

meta-moxa/

- layer.conf
- COPYING.MIT
- README
  - - └── hello-mod
      - \_\_\_\_\_ files
        - COPYING
        - hello.c
        - —— Makefile
        - —— hello-mod\_0.1.bb
- 3. Delete the unnecessary files in hello-mod. Rename the hello-mod.
  - \$ cd ./meta-moxa/recipes-kernel
  - \$ rm ./hello-mod/files/COPYING
  - \$ rm ./hello-mod/files/hello.c
  - \$ mv ./hello-mod/hello-mod 0.1.bb ./hello-mod/realtty-kernel 0.1.bb
  - \$ mv ./hello-mod realtty-kernel
- 4. Extract the Real TTY source code in /moxa. Copy the following files into hello-mod:
  - \$ cp /moxa/COPYING-GPL.TXT ./realtty-kernel/files/
  - \$ cp /moxa/npreal2.c ./realtty-kernel/files/
  - \$ cp /moxa/npreal2.h ./realtty-kernel/files/
  - \$ cp /moxa/np\_ver.h ./realtty-kernel/files/
- 5. The content of the recipes-kernel now is listed below:

6. Modify the content of the file "./realtty-kernel/files/Makefile" as follows:

```
obj-m := npreal2.o
SRC := $(shell pwd)
all:
$(MAKE) -C $(KERNEL_SRC) M=$(SRC)
modules_install:
$(MAKE) -C $(KERNEL_SRC) M=$(SRC) modules_install
clean:
rm -f *.o *~ core .depend .*.cmd *.ko *.mod.c
rm -f Module.markers Module.symvers modules.order
rm -rf .tmp versions Modules.symvers
```

7. Modify the content of the file './realtty-kernel/realtty-kernel\_0.1.bb' as follows:

```
DESCRIPTION = "Linux kernel module for NPort"
LICENSE = "GPLv3"
LIC_FILES_CHKSUM = "file://COPYING-GPL.TXT;md5=3c34afdc3adf82d2448f12715a255122"
inherit module
SRC_URI = " \
file://Makefile \
file://npreal2.h \
file://npreal2.h \
file://npreal2.c \
file://COPYING-GPL.TXT \
"
S = "${WORKDIR}"
```

# The inherit of module.bbclass will automatically name module packages with the prefix"kernelmodule-" as required by the OpenEmbedded Core-build environment.

```
\label{eq:RPROVIDES_$PN} += "kernel-module-npreal2"
```

#### Create a recipe for the Real TTY utilities

Similar to creating a realtty-kernel recipe, create a recipe for facilitating the NPort management.

- 1. Create directory below in meta-moxa:
  - \$ cd /home/user/poky

\$ mkdir -p ./meta-moxa/recipes-utility/realtty-tools/files

 Copy the Moxa driver which can be downloaded from the Moxa product web page directly. The driver's name format is npreal2\_vM.N\_BUILD-DATE.tgz.

```
$ cp /home/user/download/npreal2_vM.N_BUILD_DATE.tgz ./meta-moxa/recipes-
utility/realtty-tools/files/
```

Create a bb file ./meta-moxa/recipes-utility/realtty-tools/realtty-tools.bb, which has the following content:

```
DESCRIPTION = "Service utilities for NPort"
LICENSE = "GPLv3"
LIC_FILES_CHKSUM = "file://moxa//COPYING-GPL.TXT;md5=3c34afdc3adf82d2448f12715a255122"
# OpenSSL is required for secured mode
```

DEPENDS = "openssl"

```
# Specify the compressed driver file for SRC_URI
SRC_URI = "file://npreal2_vM.N_BUILD-DATE.tgz"
```

S = "\${WORKDIR}"

# Specify the destination of RealTTY driver DEST\_DIR = "\${D}\${libdir}/npreal2/driver" FILES \${PN} += "\${libdir}/npreal2/driver/\*"

# If it is required to connect the NPort with the SSL secure mode (secure mode is available in the NPort 6000 Series only), unremark the following line: #SSL\_MODE = "yes"

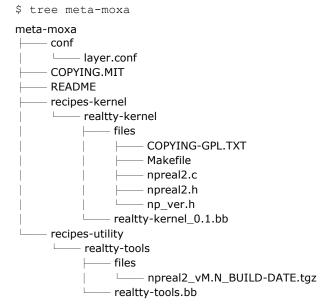
```
do_compile () {
${CC} -o mxaddsvr ${S}/moxa/mxaddsvr.c ${S}/moxa/misc.c
${CC} -o mxdelsvr ${S}/moxa/mxdelsvr.c ${S}/moxa/misc.c
```

```
${CC} -o mxcfmat ${S}/moxa/mxcfmat.c
${CC} -o mxloadsvr -DNO INIT ${S}/moxa/mxloadsvr.c ${S}/moxa/misc.c
${CC} -o mxsetsec -DNO_INIT ${S}/moxa/mxsetsec.c ${S}/moxa/misc.c
if [ ${SSL MODE} = "yes" ], then
${CC} -o npreal2d redund -lssl -lpthread -DSSL ON -DOPENSSL NO KRB5 ${S}/moxa/redund main.c
${S}/moxa/redund.c
${CC} -o npreal2d -lssl -DSSL_ON -DOPENSSL_NO_KRB5 ${S}/moxa/npreal2d.c
or else
${CC} -o npreal2d_redund -lpthread ${S}/moxa/redund_main.c ${S}/moxa/redund.c
${CC} -o npreal2d ${S}/moxa/npreal2d.c
fi
}
do_install () {
install -m 0755 -d ${DEST_DIR}
install -m 0755 ${S}/mxaddsvr ${DEST_DIR}
install -m 0755 ${S}/mxdelsvr ${DEST_DIR}
install -m 0755 ${S}/mxcfmat ${DEST_DIR}
install -m 0755 ${S}/mxloadsvr ${DEST_DIR}
install -m 0755 ${S}/mxsetsec ${DEST_DIR}
install -m 0755 ${S}/moxa/mxmknod ${DEST_DIR}
install -m 0755 ${S}/moxa/mxrmnod ${DEST_DIR}
install -m 0755 ${S}/npreal2d ${DEST_DIR}
install -m 0755 ${S}/npreal2d_redund ${DEST_DIR}
install -m 0755 ${S}/moxa/npreal2d.cf ${DEST_DIR}
}
# Ignore GNU HASH (did not pass LDFLAGS)
INSANE_SKIP_${PN} = "Idflags"
```

#### NOTE

The file name of SRC\_URI must be the same as it was copied in the last step.

4. The content of meta-moxa is listed as below:



#### Install a Moxa Layer Into the Yocto Project

1. Install the Moxa layer and Real TTY recipes into the Yocto Project.

```
$ cd /home/user/poky
```

```
$ source oe-init-build-env
```

- Use a text editor to add the following content to the configuration file: './conf/bblayers.conf':
- 3. Add this line "/home/user/poky/meta-moxa' to BBLAYERS

```
BBLAYERS ?= " \
/home/user/poky/meta \
/home/user/poky/meta-poky \
/home/user/poky/meta-yocto-bsp \
/home/user/poky/meta-raspberrypi \
/home/user/poky/meta-moxa \
```

Use a text editor to add the following content to the configuration file:
 './conf/local.conf':

IMAGE\_INSTALL\_append += " realtty-tools realtty-kernel"

#### **Deploy the Yocto Image in Raspberry Pi**

Build the image with the Real TTY driver:

```
$ cd /home/user/poky
```

- \$ source oe-init-build-env
- \$ bitbake core-image-base

An SD-card format image (.rpi-sdimg) is generated under

/home/user/poky/build/tmp/deploy/images/raspberrypi3. It is suggested to use the Raspberry Pi official tool 'rpi-imager' to burn the image into the SD-card and then boot it into the Linux kernel in Raspberry Pi.

#### Start the Real TTY Driver in Raspberry Pi

After logging into the system, start the Real TTY driver

root@raspberrypi3:~# modprobe npreal2

[ 39.906812] npreal2: loading out-of-tree module taints kernel.

[ 39.913379] Moxa Async/NPort server family Real TTY driver ttymajor 33 calloutmajor 38 verbose 1 (Ver5.1)

For example, we illustrate how to add a 4-port NPort with the IP address: 192.168.127.254

root@raspberrypi3:~# cd /usr/lib/npreal2/driver root@raspberrypi3:/usr/lib/npreal2/driver# ./mxaddsvr 192.168.127.254 4 Adding Server...

ttyr00, cur00 ttyr01, cur01 ttyr02, cur02 ttyr03, cur03 Added Real Com IP : 192.168.127.254

Now the device node /dev/ttyr00  $\sim$  /dev/ttyr03 is created for tty port use.

### Set the Default tty Mapping to the Real TTY Configuration

You may use the Real TTY configuration file, npreal2d.cf that we set up in 4.5, as the default settings when deploying to a new Raspberry Pi image.

- Copy and replace npreal2d.cf in the NPort Real TTY driver folder '/moxa' extracted in the build system.
- 2. tar -zxvf new\_npreal2\_driver.tgz /moxa
- 3. Go back to "Create a recipe for the Real TTY utilities", change the name of npreal2\_vM.N\_BUILD\_DATE.tgz with the file name in step 2.)
- 4. Rebuild the image.

#### Troubleshooting

If the following error is encountered during the building of the image,

ERROR: Task (/home/user/poky/meta/recipes-devtools/binutils/binutils\_2.34.bb:do\_compile) failed with exit code '1'

It is suggested to compile binutils first, then compile the entire image:

\$ bitbake binutils -c do\_compile
\$ bitbake core-image-base

### **Basic Procedures**

To map an NPort 5000 serial port to a Mac host's tty port, follow these instructions:

- 1. Set up the NPort 5000. Verify the IP configuration works by using ping, telnet, etc.
- 2. Install the Mac driver files on the host.
- 3. Search or manually input the IP address of the NPort to set up virtual COM port.

### **Hardware Setup**

Before proceeding with the software installation, make sure you have completed the hardware installation. Note the default IP address for the NPort 5000 is 192.168.127.254.

#### **Installing macOS TTY Driver Files**

#### NOTE

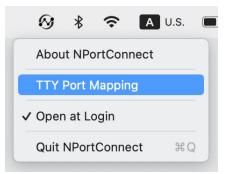
For the newest information, refer to readme.txt on Mac TTY Driver. Resources location of product information, release note, and readme file: /usr/local/share/NPortConnect

- 1. Obtain the driver file from Moxa's website, at <a href="http://www.moxa.com">http://www.moxa.com</a>. You may find it in the Resource section under your product page.
- 2. Execute the installer package 'moxa-macOS-tty-drivers-for-macOS-xx.xx-or-later-vx.x.pkg'.
- 3. Follow the instruction of each step and complete the installation.
- 4. Press Continue in the Destination Select window.
- 5. In the final step, you may find the location of driver's document and also instruction of driver uninstall.

• • •	🥪 Install NPortConnect 🕒
<ul> <li>Introduction</li> <li>License</li> <li>Destination Select</li> <li>Installation Type</li> <li>Installation</li> <li>Summary</li> </ul>	The installation was completed successfully.           NPortConnect pseudo-tty driver for NPort series           Thank you for installation. Now you can find and launch the NPortConnect service on Apple Status Bar near the upper right corner.           Resources           Location of product information, release note, and readme file:           /usr/local/share/NPortConnect
ΜΟΧΛ	Go through following links for additional information.  • <u>Moxa Inc.</u> Uninstall NPortConnect pseudo-tty driver Run the following command to uninstall driver.  \$ sudo bash /usr/local/share/NPortConnect/uninstall.sh Go Back Close

## Mapping macOS TTY port

1. In the menu bar, a NPortConnect icon should appear after the installation is completed. Click on the icon and choose **TTY Port Mapping** to start COM port mapping.



- 2. Click the NPortConnect icon and select NPort Mapping for the port mapping function.
- 3. Click + to enter the tty port setup.

				NPortConnec	rt			
No	1	TTY Name	T	IP Address	[	Port	SSL	
1		ttys002		192.168.127.254		950	Unencrypted	٥
2		ttys003		192.168.127.254		951	Unencrypted	
-								
-								
				2 items				(
(+)	_						Cancel	Apply

4. Click Search to find the NPort that is already setup in the Hardware Setup procedure. The Search function is broadcast search to locate all the NPort units that are connected to the same LAN as your Mac. Since the Broadcast Search function searches by MAC address and not IP address, all NPort units connected to the LAN will be located, regardless of whether they are part of the same subnet as the host. Or, you can input the IP address manually to find the specific NPort. Once the search is completed, all the NPort found would appear on the list.

Selec	t From List	Search	Select A	Clear All
No	Model	MAC Address	IP Address	
1	NPort 5450I	00:90:E8:9A:E0:BF	192.168.1.22	2
2	NPort 5210A	00:90:E8:AD:45:6A	192.168.127.2	254
3	NPort 5210A	00:90:E8:AD:45:10	192.168.127.2	253
Input	Manually		IP Address:	192.168.127.254
		First	Mapping Port:	950

5. Select the models that are for the tty port mapping and click **OK**.

Select	From List	Search	Select A	All Clear All
No	Model	MAC Address	IP Address	
<b>V</b> 1	NPort 5450I	00:90:E8:9A:E0:BF	192.168.1.22	2
<b>V</b> 2	NPort 5210A	00:90:E8:AD:45:6A	192.168.127.	254
3	NPort 5210A	00:90:E8:AD:45:10	192.168.127.	253
Input	Manually		IP Address:	192.168.127.254
		First	Mapping Port:	950
			Total Amount:	1
			rotar / intoant.	1

6. NPortConnect would auto assign the tty name and corresponding port number to the IP address of the selected NPort. One port is for data exchange, another port is for sending commands.

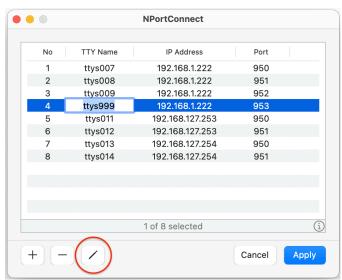
•		NPortConnect	
No	TTY Name	IP Address	Port
1	ttys007	192.168.1.222	950
2	ttys008	192.168.1.222	951
3	ttys009	192.168.1.222	952
4	ttys010	192.168.1.222	953
5	ttys011	192.168.127.253	950
6	ttys012	192.168.127.253	951
7	ttys013	192.168.127.254	950
8	ttys014	192.168.127.254	951
		8 items	(
+ -			Cancel Apply



#### NOTE

It is suggested to rename the assigned tty port, e.g., tty.serial\_nport00x or similar, for easier serial communication application integration.

7. The tty name, IP address and port number are editable, or you can click the edit button to edit. Note that these changed values are only for mapping configuration and would not change the values in the NPort settings.



8. When everything is set, click **Apply** to save the configuration.

• •		NPortConnect		
No	TTY Name	IP Address	Port	
1	ttys007	192.168.1.222	950	
2	ttys008	192.168.1.222	951	
3	ttys009	192.168.1.222	952	
4	ttys998	192.168.1.222	953	
5	ttys011	192.168.127.253	950	
6	ttys012	192.168.127.253	951	
7	ttys013	192.168.127.254	950	
8	ttys014	192.168.127.254	951	
		8 items		(
+ -			Cancel	Apply

9. In each editing interface, there is an info icon at the bottom of the list. A mouse-over would show the original value of each tty port, in case of miss-editing something and you want to refer the original value.

(	Cui	rrent Configuration	1
	TTY Name	IP Address	Port
_	ttys007	192.168.1.222	950
$\sim$	ttys008	192.168.1.222	951
(i)	ttys009	192.168.1.222	952
C	ttys011	192.168.127.253	950
ylq	ttys012	192.168.127.253	951
pry	ttys013	192.168.127.254	950
_	ttys014	192.168.127.254	951
	ttys999	192.168.1.222	953

# Secured Communication (For NPort 6000-G2 and NPort 6000 models only)

NPort 6000-G2 models and NPort 6000 models provide secured communication for data transmission.

#### **Import Local Certificate**

1. Click Security icon

• •	NPortConnect					
	No	TTY Name	IP Address	Port	SSL	
	1	ttys002	192.168.127.254	950	Unencrypted	٥
	2	ttys003	192.168.127.254	951	Unencrypted	٥
-			2 items			(i)
+	•) (				Cancel	pply

#### Certificate pane would appear:

	Certificate		
	Gentinoate	> _l_ ↑	
Local Certificate			
Subject	NPortConne	ct530511967	
Issuer	NPortConne	ct530511967	
Issue Date		(null)	Certification information at driver side
Expiration Date	2044-1	0-18 10:53:17	at unver side
Validation Status		🤣 👘	
Device Certificates			
File Name	Expiration Date		
			Certification information at
			NPort's side as reference
+   -			

#### 2. Click Import Private Key and Certificate

	Certificate
Local Certificate	Û.
Subject	NPortConnect530511967
lssuer	NPortConnect530511967
Issue Date	(null)
Expiration Date	2044-10-18 10:53:17
Validation Status	🕹 -
Device Certificates	
File Name	Expiration Date
+   -	

Certificate import window, click either Private Key '+' or Certificate '+' to import your key or certificate.

#### NOTE

If you file contains both private key and certificate, NPortConnect would help to import to each file holder.

If a private key or certificate is imported successfully, the red cross icon would change to green tick icon.

Private Key Certificate
Complicate

Or else, it would remain red cross icon. Click **Import** button once everything is imported.

In Certificate pane you should be able to see the	e Subject and Issuer,	Issue and Expiraration Date
are updated.		

Subject	HTTPS Certificate for ECC
Subject	HTTPS Certificate for ECC
Issuer	HTTPS Certificate for ECC
Issue Date	2024-07-31 08:50:02
Expiration Date	2026-07-31 08:50:02
Validation Status	•
Device Certificates	
File Name	Expiration Date

#### **Device Certificate**

The **Device Certificate** is to help to display the certificate used in NPort, so you would know which certificate to import for the driver.

• •	Certificate
ocal Certificate	Ċ ŀ ĺ
Subject	HTTPS Certificate for ECC
Issuer	HTTPS Certificate for ECC
Issue Date	2024-07-31 08:50:02
Expiration Date	2026-07-31 08:50:02
Validation Status	👲
Device Certificates	
File Name	Expiration Date
NPort_6000-G2_cert.pem	2026-07-31 08:50:02
+ )-	

#### **Regenerate Local Certificate**

If you wish to cancel the key or certificate that imported, or change the local certificate to another set, click **Regenerate Local Certificate**.

HTTPS Certificate for ECC HTTPS Certificate for ECC 2024-07-31 08:50:02 2026-07-31 08:50:02
HTTPS Certificate for ECC 2024-07-31 08:50:02
2024-07-31 08:50:02
2026-07-31 08:50:02
<b>0</b>
iration Date
26-07-31 08:50:02

#### **Selecting Proper Encryption Methodology**

In the main window, you would need to specify which encryption methodology for your communication with NPort.

No	TTY Name	IP Address	Port	SSL	
1	ttys002	192.168.127.254	950	Unencrypted	;
2	ttys003	192.168.127.254	951	Unencrypted	
		1 of 2 selected			

Encrypted & Authenticate: NPort 6000-G2 and NPort 6000 models only

Unencrypted: For all models

### **Uninstalling the Driver**

Run the following command to uninstall the driver:

\$ sudo bash /Library/NPortConnect/uninstall.sh

NPort CE Driver Manager for Windows CE applies to the **NPort 5000 and NPort IA5000 Series** only.

### **Overview**



#### ATTENTION

Before installing and configuring the NPort Administration suite, make sure your user privilege is set as system administrator.

### **Installing NPort CE Driver Manager**

- 1. Copy "NPortCab.cab" to Windows CE and install driver by double clicking on it.
- 2. Click on "OK" to complete the installation when the following screen appears.

Install Default Company Name NP	<b>E</b> 💣	B-B- B-D- B-D-	? OK	×
🔍 \Program Files				
🚟 Command Prompt				
				- 11
				- 11
				- 11
				- 11
				=1
Name: NPortCab Type:				▼

3. Driver installation is now complete and the "NPortCab.cab" icon disappears from the screen. This is normal when installing drivers in Windows CE.

### **Using NPort CE Driver Manager**

After you install NPort CE Driver Manager, you can set up the NPort's serial ports as remote COM ports for your Windows CE. Make sure that the serial port(s) on your NPort are set to Real COM mode when mapping COM ports with NPort CE Driver Manager.

1. Go to **Start > Programs > NPort CE Driver Manager**.

NPort CE D	)river Manager			OK ×
COM Settin				
СОМ	IP Addr	Data/Cmd		Delete All
Settings	• <b>•</b>	] Save	]	
0 COM port	(s) was found.	1		

2. Click on the **COM Mapping** page and then the "Search" button to scan for NPort servers

NPort CE Drive	er Manager		ок 🗙
COM Setting	OM Mapping Abo	ut	
Model	IP Addr	Ports	Search
NPort 5110	192.168.127.254	1	Stop
			Modify IP
			Search , Completed.
Port Index —	Add	_	
	Select the port index of NPort that you		
	want to ad	a.	

- All NPort servers that were located will appear in the NPort CE Driver Manager window. Click on the server which COM ports you would like to map to and then select the port index. Note that multiple selections are allowed.
- 4. Select the port(s) at the Port Index and then click on the "Add" button to map to the COM port(s).

NPort CE Drive	r Manager		ок 🗙
COM Setting	OM Mapping Abo	ut	
Model	IP Addr	Ports	Search
NPort 5110	192.168.127.254	1	Stop
			Modify IP
rPort Index			Search — Completed.
Port1 (950/9			
	Select the of NPort th want to ad	iat you	x
NPort 5110 (192	.168.127.254) is sele	cted.	

5. Return to the **COM Setting** page. You should be able to see the newly mapped COM port(s).

NPort CE D	)river Manager		OK ×
COM Settin	g COM Mapping	About	
COM COM2	IP Addr 192.168.127.254	Data/Cmd 950/966	Delete All
Settings —			
Tx Mode FIFO		Save	
1 COM port	(s) was found.		

6. To configure the settings for a particular COM port, select the row of the desired port, and then change the setting in the "Settings" panel, as shown below.

NPort CE D	)river Manager		OK ×
COM Settin	g COM Mapping	About	
COM COM2	IP Addr 192.168.127.254	Data/Cmd 950/966	Delete All Delete
Settings —	H-performance	- Save	
FIFO COM2 is sel	Enable <b>e</b> cted.	]	

#### Tx Mode

"Hi-Performance" is the default for Tx mode. After the driver sends data to the NPort server, the driver immediately issues a "Tx Empty" response to the program. Under "Classical mode," the driver will not send the "Tx Empty" response until after confirmation is received from the NPort server's serial port. This causes lower throughput. Classical mode is recommended if you want to ensure that all data is sent out before further processing.

#### FIFO

If FIFO is disabled, the NPort server will transmit one byte each time the Tx FIFO becomes empty, and an Rx interrupt will be generated for each incoming byte. This will cause a faster response and lower throughput.

### **Overview**

#### What is IP Serial Library?

IP Serial Library is a Windows library with frequently used serial command sets and subroutines. IP Serial Library reduces the complexity and poor efficiency of serial communication over TCP/IP. For example, Telnet can only transfer data, but it cannot monitor or configure the serial line's parameters.

#### Why Use IP Serial Library?

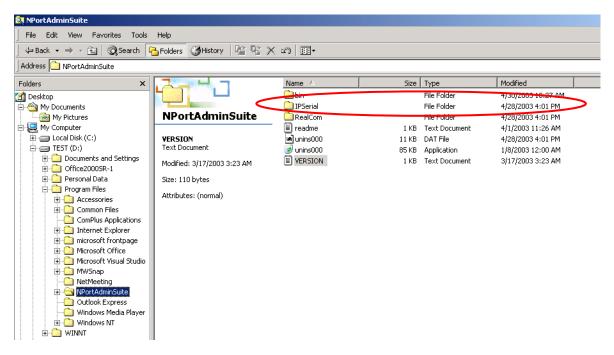
For programmers familiar with serial communication, IP Serial Library provides well-designed function calls that have the same style as Moxa's PComm Library.

IP Serial Library is amazingly simple and easy to understand. By including it in your VB, C, or Delphi programming environment, you can program your own TCP/IP application with the ability to control serial communication parameters.

The NPort serial device server uses 2 TCP ports for communication between the NPort and host computer's Real COM driver. The NPort uses a data port and command port to provide pure data transfer without decoding and encoding. Compared to using only one TCP port to control serial communication (such as RFC 2217), IP Serial Library uses a command port to communicate with the NPort from the user's program. IP Serial Library not only runs with excellent efficiency, but also runs with no decode or encode problems.

#### How to Install IP Serial Library

IP Serial Lib comes with the NPort Administration Suite. Refer to the IPSerial directory for more detail about the function definitions.



### **IP Serial LIB Function Groups**

Server Control	Port Control	Input/Output Data	Port Status Inquiry	Miscellaneous
nsio_init nsio_end nsio_resetserver nsio_checkalive	nsio_open nsio_close nsio_ioctl nsio_flowctrl nsio_DTR nsio_RTS nsio_lctrl nsio_baud nsio_resetport	nsio_read nsio_SetReadTimeouts nsio_write nsio_SetWriteTimeouts	nsio_lstatus nsio_data_status	nsio_break nsio_break_on nsio_break_off nsio_breakcount

### **Example Program**

```
char NPort 5100A-Nip="192.168.1.10";
char buffer[255];
                                              /*data buffer, 255 chars */
                                              /*1st port */
int port = 1;
int portid;
                                              /* port handle */
                                              /*initial IP Serial Library */
nsio init();
portid = nsio_open(NPort 5100Aip, port);
                                              /*1st port, NPort 5100A
nsio_ioctl(portid, B9600, (BIT_8 | STOP_1 | IP=192.168.1.10 */
P_NONE) );
                                              /*set 9600, N81 */
                                              /* wait for 1000 ms for data */
sleep(1000);
nsio_read(port, buffer, 200);
                                              /* read 200 bytes from port 1 */
nsio_close(portid);
                                              /* close this serial port */
                                              /* close IP Serial Library */
nsio_end();
```

### **Overview**

If you want to remote control your serial devices on an Android platform, then the MxNPortAPI is a simple application programming tool you can use. The MxNPortAPI helps programmers develop an Android application to access the device server by TCP/IP.

The MxNPortAPI provides frequently used serial command sets like port control, input/output, etc., and the style of developed Android application is similar to Moxa Driver Manager. For more details of the provided functions, refer to the "MxNPortAPI Function Groups" section.

This MxNPortAPI is layered between the Android application and the Android network manager framework. This Android library is compatible with Java 1.7, Android 3.1 (Honeycomb - API version 12), and later versions.

Android Platform							
Application (Phone, Contacts, Camera)							
Java API MxNPortAPI							
Frameworks (USB, Package, Location)							
Libraries Dalvik Runtime							
Linux Kernel							

#### How to Start MxNPortAPI

You can download the MxNPortAPI from Moxa's website at <a href="http://www.moxa.com">http://www.moxa.com</a>, and develop the application program in popular Oss, such as Windows, Linux, or Mac. (You may find it in the **Resource** section under your product page.)

(You can refer to the Android studio website to see the system requirements for the development environment: <u>https://developer.android.com/studio/index.html?hl=zh-tw#Requirements</u>).

To start your application program, unzip the MxNPortAPI file and refer to the index (.html) under the Help directory.

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Documents       Constant-values       11/8/2017 8:02 PM       HTML Document       19 KB         Music       deprecated-list       10/26/2017 5:30 PM       HTML Document       4 KB         Fibrures       help-doc       11/8/2017 8:02 PM       HTML Document       8 KB         Videos       index-all       10/26/2017 3:30 PM       HTML Document       3 KB         Computer       index-all       10/26/2017 3:32 PM       HTML Document       46 KB         Computer       index-all       10/26/2017 3:32 PM       HTML Document       16 KB         overview-uree       11/8/2017 8:02 PM       HTML Document       20 KB         Network       overview-tree       11/8/2017 8:02 PM       HTML Document       6 KB         Script       11/8/2017 8:02 PM       File       1 KB         Script       11/8/2017 8:02 PM       HTML Document       5 KB	_					
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stylesheet 9/15/2017 5:41 PM Cascading Style S 14 KB		🥖 serialized-form	11/8/2017 8:02 PM	HTML Document	5 KB	
		🗿 stylesheet	9/15/2017 5:41 PM	Cascading Style S	14 KB	

For more details about the installation, refer to the Overview section.

All Classes	JavaScript is disabled on your browser.
McException	OVERVIEW PACKAGE CLASS TREE INDEX HELP
McException.EmorCode Mt/NPort	PREV NEXT FRAMES NO FRAMES ALL CLASSES
Mi/NPort.FlowOrl Mi/NPort.loct/Mode	This document is the programming guide for the MxNPortAPL.
MrNPort.LineError MrNPort.ModemStatus	See: Description
Mt/NPortService Version	
	Packages
	Package Description
	com mora manportapi
	This document is the programming guide for the MxXPortAPI. You can get information about how to code with the MxXPortAPI quickly and how to link the MxXPortAPI Library into your program.
	1. Introduction to the NPort Android API
	Android Platform
	Application
	(Phone, Contacts, Camera)
	Java API MxNPortAPI
	Frameworks
	(USB, Package, Location)
	Libraries Dalvik
	Runtime
	Linux Kernel
	LINUK KETTER

## **MxNPortAPI Function Groups**

The supported functions in this API are listed below:

Port Control	Input/Output	Port Status Inquiry	Miscellaneous
open	read	getBaud	setBreak
close	write	getFlowCtrl	
setIoctlMode		getIoctlMode	
setFlowCtrl		getLineStatus	
setBaud		getModemStatus	
setRTS		getOQueue	
setDTR			
flush			

### **Example Program**

To make sure this API is workable with the device server on an Android platform, see the example program below:

```
Thread thread = new Thread()
{
  @Override
  public void run() {
     /* Enumerate and initialize NPorts on system */
     List<MxNPort> NPortList = MxNPortService.getNPortInfoList();
     if(NPortList!=null){
      MxNPort.IoctlMode mode = new MxNPort.IoctlMode();
        mode.baudRate = 38400;
        mode.dataBits = MxNPort.DATA BITS 8;
        mode.parity = MxNPort.PARITY NONE;
        mode.stopBits = MxNPort.STOP_BITS_1;
        MxNPort mxNPort = NPortList.get(0); /* Get first NPort device */
       try {
          byte[] buf = {'H','e','l','l','o',' ','W','o','r','l','d'};
          mxNPort.open(); /*open port*/
          mxNPort.setIoctlMode(mode); /*serial parameters setting*/
          mxNPort.write(buf, buf.length); /*write data*/
          mxNPort.close(); /*close port*/
       } catch (MxException e){
           /*Error handling*/
       }
     }
   }
};
thread.start();
```

Typically, you will use either NPort Administrator or the web console to configure the NPort 5600-8-DT Series (standard temperature models), the NPort 5600 Series (standard temperature models) and the NPort 5410/5430 Series (standard temperature models). These are not the only options for configuration. For basic on-site configuration, you can use the LCM console built into the device server, without requiring a connection to the network or a laptop.

In this chapter, we will introduce the basic operation and menu options of LCM display.

### **Basic Operation**

If the NPort works properly, the LCM panel will display a green color. The red Ready LED will also light up, showing that the NPort is receiving power. After the red Ready LED turns to green, you will see a display similar to:

N	P	5	4	1	0	_	6	1	4	0	5				
1	9	2		1	6	8		1	2	7		2	5	4	

This is where

- NP5410 is the NPort's name
- 61405 is the NPort's serial number
- 192.168.127.254 is the NPort's IP address

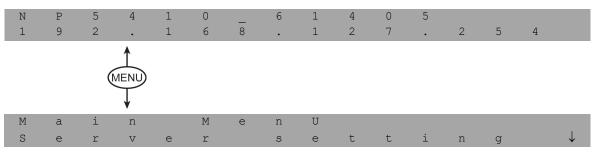
There are four push buttons on the NPort's nameplate. Going from left to right, the buttons are:

Button	Name	Action
menu	menu	activates the main menu, or returns to a lower level
$\bigtriangleup$	up cursor	scrolls up through a list of items shown on the LCM panel's second line
$\bigtriangledown$	down cursor	scrolls down through a list of items shown on the LCM panel's second line
sel	select	selects the option listed on the LCM panel's second line

The buttons are manipulated in a manner similar to the way a modern cellular phone operates. As you move through the various functions and setting options, note that the top line shows the current menu or submenu name, and the bottom line shows the submenu name or menu item, which is activated by pressing the SEL button.

### **Detailed Menu Options**

The best way to explain all the NPort's LCM functions is to refer to the tree graph shown on the next page. There are three main levels-1, 2, and 3—with each level represented by a separate column. The first thing to remember is that the menu button is used to move back and forth between the LCM panel's default screen and the main menu screen:



In addition, you only need to remember to:

- Use the SEL button to move up one level (i.e., left to right on the tree graph)
- Use the MENU button to move down one level (i.e., right to left on the tree graph)
- Use the cursor keys, r and s, to scroll between the various options within a level (i.e., up and down on the tree graph).

As you use the buttons to operate the LCM display, you will notice that with very few exceptions, moving up one level causes the bottom line of the display to move to the top line of the display. You will also notice that the bottom three options in level 2, and all of the options in level 3 have either a C or D attached. The meaning is as follows:

• C = configurable

I.e., you may change the setting of this option

D = display only

I.e., the setting for this option is displayed, but it cannot be changed (This does NOT mean that the number does not change; only that you cannot change it)

Main Menu						
	Server setting	Serial number				D
		Server name				С
		Firmware ver				D
		Model name				D
	Network setting	Ethernet status				D
		MAC address				D
		IP config				С
		IP address				С
		Netmask				С
		Gateway				С
		DNS server 1				С
		DNS server 2				С
	Serial set	Select port				С
		Baudrate				С
		Data bit				С
		Stop bit				С
		Parity				С
		Flow control				С
		Tx/Rx fifo				С
		Interface				С
		Tx/Rx bytes				D
		Line status				D
	Op Mode set	Select port				С
		Select mode				С
		[mode]				
		Real COM	TCP server	TCP client	UDP svr/cli	
		Alive timeout	Alive timeout	Alive timeout	Delimiter 1	С
		Max connection	Inact. time	Inact. time	Delimiter 2	С
		Delimiter 1	Max connection	Delimiter 1	Force Tx	С
		Delimiter 2	Delimiter 1	Delimiter 2	Dest IP start-1	С
		Force Tx	Delimiter 2	Force Tx	Dest IP end-1	С
			Force Tx	Dest IP-1	Dest port-1	С
			Local TCP port	TCP port-1	Dest IP start-2	С
			Command port	Dest IP-2	Dest IP end-2	С
				TCP port-2	Dest port-2	С
				Dest IP-3	Dest IP start-3	С
				TCP port-3	Dest IP end-3	С
				Dest IP-4	Dest port-3	С
				TCP port-4	Dest IP start-4	С
				TCP connect	Dest IP end-4	С
					Dest port-4	С
					Local port	С

Console	Web console		С
	Telnet console		С
Ping			С
Save/Res	start		С

The part of the LCM operation that still requires some explanation is how to edit the configurable options. In fact, you will only encounter two types of configurable options.

The first type involves entering numbers, such as IP addresses, Netmasks, etc. Here, you change the number one digit at a time. The up cursor ( $\triangle$ ) is used to decrease the highlighted digit, the down cursor ( $\bigtriangledown$ ) is used to increase the highlighted digit, and the SEL button is used to move to the next digit. When the last digit has been changed, pressing SEL simply enters the number into the NPort's memory. The second type of configurable option is when there are only a few options from which to choose (although only one option will be visible at a time). Consider the PARITY attribute under PORT SETTING as an example. Follow the tree graph to arrive at the following PARITY screen. The first option, NONE, is displayed, with a down arrow all the way to the right. This is a sign that there are other options from which to choose.

P	а	a r	: i	t	Y
N	0	o n	ı e		

Press the down cursor button once to see Odd as the second option.

P	а	r	i	t	Y	$\uparrow$
0	d	d				$\downarrow$

Press the down cursor button again to see Even as the third option.

P	а	r	i	t	Y	$\uparrow$
E	V	е	n			$\downarrow$

Press the down cursor button again to see Space as the fourth option.

P	а	r	i	t	Y	$\uparrow$
Μ	a	r	k			$\downarrow$

Press the down cursor button yet again to see the last option, Space.

Р	a	r	i	t	Y	$\uparrow$
						•
S	р	а	С	е		

To choose the desired option, press the SEL button when the option is showing on the screen.

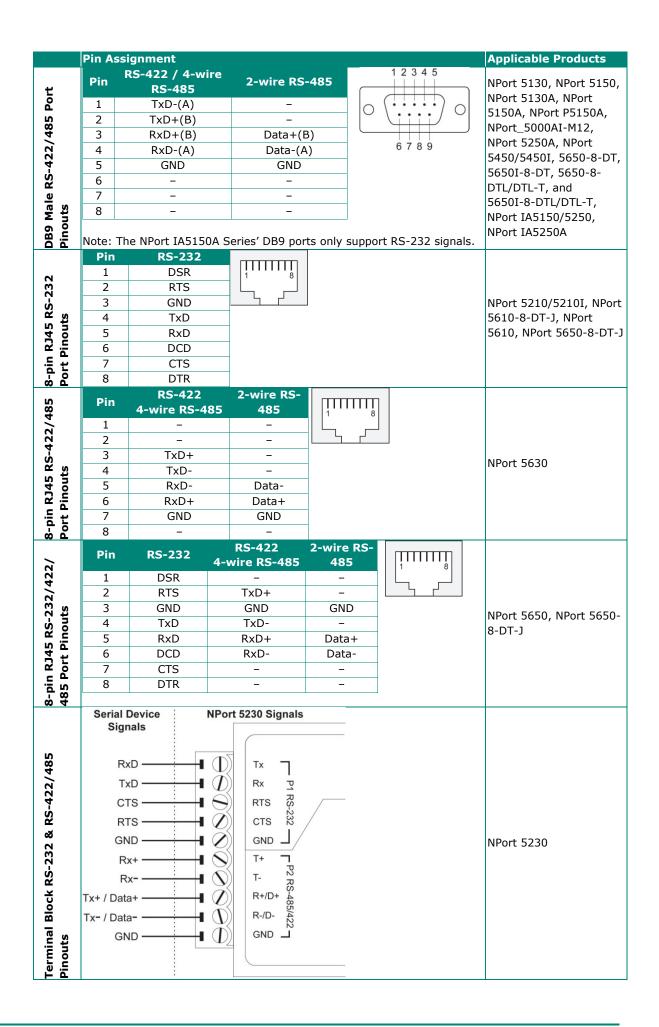
## **Port Pinout Diagrams**

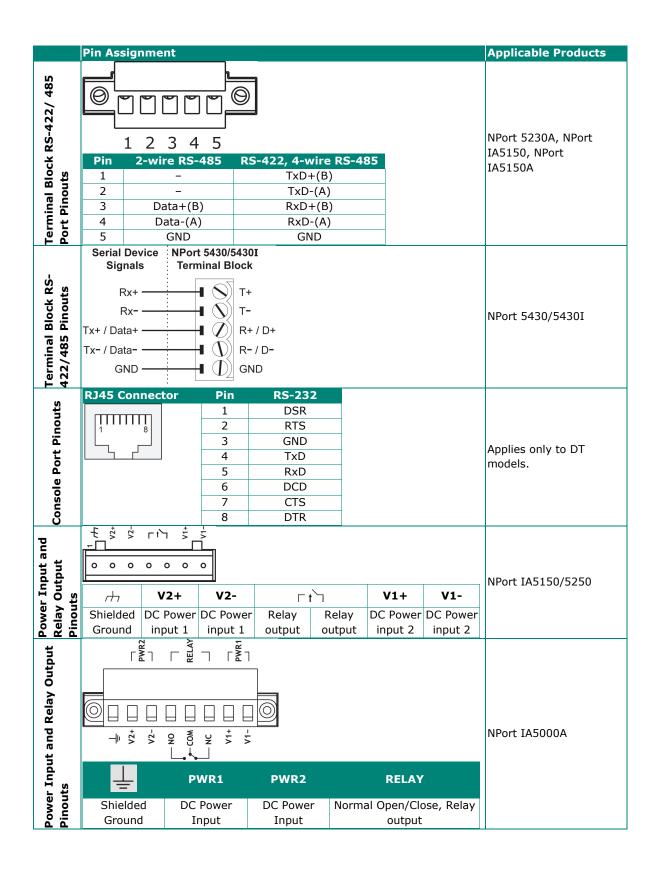
### **Ethernet Port Pinouts**

Ethern	et RJ45	Ethernet M12 (For NPort 5000AI-M12 on	ıly)	
Pin	Signal	Ethernet M12:		
1	Tx+			
2	Tx-	1 8		
3	Rx+			
6	Rx-	$\begin{bmatrix} 1 \\ -2 \end{bmatrix} RD + \begin{bmatrix} 2 \\ -2 \end{bmatrix} 3$	RD+ 2 3	
		4 RD-		
		Housing: shield		
		Power M12:		
		PIN Description		
		3 2 1 Input V+		
		2 Not assigned		
		3 Input V-		
		4 Not assigned		
		4 5 Function ground		
		5		

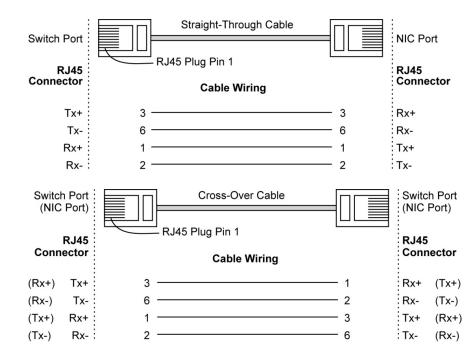
### **Serial Port Pinouts**

	Pin Ass	ignment		Applicable Products
	Pin	RS-232	1 2 3 4 5	NPort 5110, NPort 5150,
	1	DCD		NPort 5110A, NPort
uts	2	RxD	$\circ$ (····) $\circ$	5150A, NPort P5150A,
Pinouts	3	TxD		NPort_5000AI-M12,
Ŀ	4	DTR		NPort 5210A, NPort
ort	5	GND	6789	5250A, NPort 5410,
Å	6	DSR		NPort 5410/5450/5450I,
32	7	RTS		NPort 5610-8-DT, 5650-
Ņ	8	CTS		8-DT, 5650I-8-DT, 5610-
RS	9	-		8-DTL/DTL-T, 5650-8-
<u>e</u>				DTL/DTL-T, and
Male				5650I-8-DTL/DTL-T,
				NPort IA5150/5250
DB9				NPort IA5150A/5250A





## **Cable Wiring Diagrams**



### **Ethernet Cables**

### **Serial Cables**

	Moxa Serial Cable Model Name	Serial Ca	ble Wiring Diagrams		
232)		Male DB9	Female DB9	Male DB9	Female DB9
9 (RS-232)		NPort			RS-232 Device
e DB9	CBL-F9M9-150	9 pins	Cable Wiring		9 pins
Female DB9 to Male	CBL-F9M9-150 CBL-F9M9-20	DCD RxD TxD DTR GND DSR RTS CTS	1	2 3 4 5 6 7 8	DCD TxD RxD DSR GND DTR CTS RTS
		Male DB9	Female DB9	Male DB25	Female DB25
DB25		NPort			RS-232 Device
		9 pins	Cable Wiring		25 pins
) Male	N/A	DCD RxD	1 <del>&lt;</del> 2 <del>&lt;</del>	3	DCD TxD
to to		TxD DTR	3	$\rightarrow$ 2 $\rightarrow$ 20	RxD DSR
Female DB9 (RS-232)		GND DSR	5	7	GND DTR
Female D (RS-232)		RTS	7	→ 4	CTS
Fei R:		CTS	8 🔫	5	RTS

	Moxa Serial Cable Model Name	NPort 521	.0, NPort 5610/5650 (RS-232)	
		RJ45 Port	RJ45 Connector Female DB9	Male DB9
e		NPort		RS-232 Device
8-pin RJ45 to DB9 Female (RS-232)		8 pins		9 pins
B9 F	CBL-RJ45SF9-150 CBL-RJ45F9-150	DSR RTS		DTR CTS
to D		GND	3 — 5	GND
45 t		TxD RxD	5 🗲 3	RxD TxD
8-pin RJ4 (RS-232)		DCD	$\begin{array}{c} 6 \\ \bullet \\ 7 \\ \bullet \\ \end{array} $	DCD RTS
8-pi (RS		DTR		DSR
32)		RJ45 Port	RJ45 Connector Male DB9	Female DB9
8-pin RJ45 to DB9 Male (RS-232)		NPort		RS-232 Device
lale (		8 pins		9 pins
80 V	CBL-RJ45SM9-150 CBL-RJ45M9-150	DSR RTS		DTR CTS
D	CDL-RJ45M9-150	GND	3 5	GND
145 1		TxD RxD	5 - 2	RxD TxD
n RJ		DCD CTS		DCD RTS
		DTR		DSR
-232)	CBL-RJ45SF25-150 CBL-RJ45F25-150	RJ45 Port	RJ45 Connector Female DB25	Male DB25
DB25 Female (RS-232)		NPort		RS-232 Device
Fer		8 pins		25 pins
B25		DSR RTS	•	DTR CTS
		GND TxD	3 7 4 3	GND RxD
8-pin RJ45 to		RxD	5 - 2	TxD
in R		DCD CTS		DCD RTS
8-p		DTR	8 6	DSR
32)		RJ45 Port	RJ45 Connector Male DB25	Female DB25
8-pin RJ45 to DB25 Male (RS-232)		NPort		RS-232 Device
Male	CBL-RJ45SM25-150	8 pins	Cable Wiring	25 pins
325	CBL-RJ455M25-150 CBL-RJ45M25-150	DSR RTS	•	DTR CTS
DI		GND	3 7	GND
145 t		TxD RxD	5 \prec 3	RxD TxD
n RJ		DCD CTS	6 - 8	DCD
8-pi		DTR		DSR

	Moxa Serial Cable Model Name	NPort 563	0 (RS-422/4-wire RS-485)	
Female 5-485)		RJ45 Port NPort 5630	RJ45 Connector Female DB9	Male DB9 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB9 Female (RS-422/4-wire RS-485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	8 pins TxD+ TxD- RxD- RxD+ GND	$\begin{array}{c} 3 \\ 4 \\ \hline \\ 5 \\ \hline \\ 6 \\ \hline \end{array} \begin{array}{c} 5 \\ \hline \\ 1 \end{array} \begin{array}{c} 5 \\ \hline \\ 3 \\ 1 \end{array}$	RxD- TxD-
Male S-485)		RJ45 Port NPort 5630		Female DB9 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB9 Male (RS-422/4-wire RS-485)	CBL-RJ45SM9-150 CBL-RJ45M9-150	8 pins TxD+ TxD- RxD- RxD+ GND	$\begin{array}{c} 3 \\ 4 \\ \hline \\ 5 \\ \hline \\ 6 \\ \hline \end{array} \begin{array}{c} 5 \\ 2 \\ 1 \end{array}$	TxD+
ale	CBL-RJ45SF25-150	RJ45 Port NPort 5630	RJ45 Connector Female DB25	Male DB25 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB25 Fema (RS-422/4-wire RS-485)	CBL-RJ45F25-150	8 pins TxD+ TxD- RxD- RxD+ GND	$3 \xrightarrow{} 7$ $4 \xrightarrow{} 3$ $5 \xrightarrow{} 2$ $6 \xrightarrow{} 8$	RxD- TxD- TxD+
325 Male RS-485)	CBL-RJ45SM25-150	RJ45 Port NPort 5630	_	Female DB25 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB25 Male (RS-422/4-wire RS-485)	CBL-RJ45M25-150	8 pins TxD+ TxD- RxD- RxD+ GND	$\begin{array}{c} 3 \\ 4 \\ 5 \\ 6 \\ \end{array} \begin{array}{c} 7 \\ 2 \\ 3 \\ 6 \\ \end{array} \begin{array}{c} 7 \\ 2 \\ 3 \\ 8 \end{array}$	RxD- TxD- TxD+

	Moxa Serial Cable Model Name	NPort 563	0 (2-wire RS-485)	
			RJ45 Connector Female DB9	Male DB9 <b>2-wire RS-485</b>
ob9 e RS-		NPort 5630		Device
8-pin RJ45 to DB9 Female (2-wire RS- 485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	8 pins Data- Data+ GND	$5 \longleftarrow 3$ $6 \longleftarrow 1$	Data+
Male 4 F		RJ45 Port	RJ45 Connector Male DB9	Female DB9
B9 M		NPort 5630		2-wire RS-485 Device
to D -485	CBL-RJ45SM9-150 CBL-RJ45M9-150			
RJ45 re RS	CPF-K142W3-120	8 pins Data-	5 < 2	9 pins Data-
8-pin RJ45 to DE (2-wire RS-485)		Data+ GND	6 ← → 1	Data+
male		RJ45 Port	RJ45 Connector Female DB25	Male DB25
8-pin RJ45 to DB25 Female 8-pin RJ45 to DB9 (2-wire RS-485) (2-wire RS-485)	CBL-RJ45SF25-150 CBL-RJ45F25-150	NPort 5630		2-wire RS-485 Device
<b>J45 t</b> RS-4		8 pins		25 pins
8-pin RJ45 to DE (2-wire RS-485)		Data- Data+ GND	6 - 8	Data- Data+ GND
Male		RJ45 Port	RJ45 Connector Male DB25	Female DB25
325	CBL-RJ45SM25-150 CBL-RJ45M25-150	NPort 5630		2-wire RS-485 Device
145 t RS-		8 pins	-	25 pins
8-pin RJ45 to DF (2-wire RS-485)		Data- Data+ GND	6 - 8	Data- Data+ GND

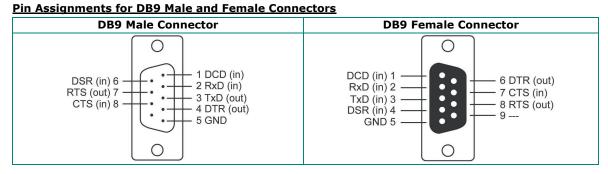
	Moxa Serial Cable Model Name	NPort 565	0 (RS-422/4-wire RS-485)	
) Female (S-485)			RJ45 Connector Female DB9	Male DB9 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB9 Female (RS-422/4-wire RS-485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	TxD+ GND TxD- RxD+	Cable Wiring2 $\rightarrow$ 83 $5$ 4 $2$ 5 $3$ 61	GND RxD- TxD+
		RJ45 Port NPort 5650		Female DB9 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB9 Male (RS-422/4-wire RS-485)	CBL-RJ45SM9-150 CBL-RJ45M9-150	TxD+ GND TxD- RxD+	Cable Wiring2 $\longrightarrow$ 73 $\longrightarrow$ 54 $\longrightarrow$ 35 $\checkmark$ 26	GND RxD- TxD+
B25 Female e RS-485)	CBL-RJ45SF25-150	RJ45 Port NPort 5650	RJ45 Connector Female DB25	Male DB25 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB25 Female (RS-422/4-wire RS-485)	CBL-RJ45F25-150	RxD+	2	TxD+
325 Male RS-485)	CBL-RJ45SM25-150	RJ45 Port NPort 5650	RJ45 Connector Male DB25	Female DB25 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB25 Male (RS-422/4-wire RS-485)	CBL-RJ45M25-150	8 pins TxD+ GND TxD- RxD+ RxD-	$\begin{array}{c} 2 & \longrightarrow 4 \\ 3 & & & 7 \\ 4 & & & 2 \\ 5 & & & 3 \end{array}$	25 pins RxD+ GND RxD- TxD+ TxD-

	Moxa Serial Cable Model Name	NPort 5650 (2-wire RS-485)			
B9 RS-		RJ45 Port NPort 5650		Male DB9 2-wire RS-485 Device	
8-pin RJ45 to DB9 Female (2-wire RS- 485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	8 pins GND Data+ Data-	$3 \xrightarrow{5} 5$	9 pins GND Data+ Data-	
Male	CBL-RJ45SM9-150	RJ45 Port NPort 5650		Female DB9 2-wire RS-485 Device	
8-pin RJ45 to DE (2-wire RS-485)	CBL-RJ45M9-150	8 pins GND Data+ Data-	3  5  2	9 pins GND Data+ Data-	
8-pin RJ45 to DB25 Female <mark>8-pin RJ45 to DB9</mark> (2-wire RS-485) (2-wire RS-485)	CBL-RJ45SF25-150 CBL-RJ45F25-150	RJ45 Port NPort 5650	RJ45 Connector Female DB25	Male DB25 2-wire RS-485 Device	
8-pin RJ45 to DE (2-wire RS-485)		8 pins GND Data+ Data-	$3 \xrightarrow{7} 2$	25 pins GND Data+ Data-	
to DB25 Male 485)	CBL-RJ45SM25-150 CBL-RJ45M25-150	RJ45 Port NPort 5650	RJ45 Connector Male DB25	Female DB25 2-wire RS-485 Device	
8-pin RJ45 to DB25 (2-wire RS-485)		8 pins GND Data+ Data-	3  7 5  3		

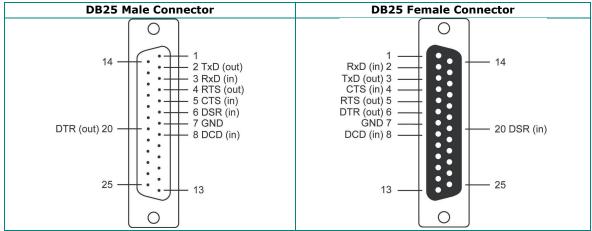
	Serial C	able W	iring Diag	rams				
	NPort							Serial Device
		RJ45	DB9(F)		DB9(M)	DB25(M)	DB25(F)	
	DSR	1	6	◄	4	6	20	DTR
	RTS	2	7	$\longrightarrow$	8	4	5	CTS
e S	GND	3	5		5	7	7	GND
Cables	TxD	4	3	$\longrightarrow$	2	2	3	RxD
	RxD	5	2	◄	3	3	2	TxD
32	DCD	6	1	◄	1	8	8	DCD
RS-232	CTS	7	8	◄	7	5	4	RTS
RS	DTR	8	4	$\longrightarrow$	6	20	6	DSR
RS-	NPort							Serial Device
4-wire es		RJ45	DB9(F)		DB9(M)	DB25(M)	DB25(F)	
N F	TxD+	2	2	$\longrightarrow$	3	3	2	RxD+
	GND	3	5		5	7	7	GND
¦22, 4-1 Cables	TxD-	4	1		1	8	8	RxD-
RS-422, 485 Cabl	RxD+	5	3	◄	2	2	3	TxD+
R9 48	RxD-	6	4	◄	6	20	6	TxD-
RS-485	NPort							Serial Device
-S-		RJ45	DB9(F)		DB9(M)	DB25(M)	DB25(F)	
e s	GND	3	5		5	7	7	GND
wir ble	Data+	5	3	$\checkmark$	2	2	3	Data+
2-wire Cables	Data-	6	4	$\checkmark$	6	20	6	Data-

# Cable Wiring for NPort 5600-8-DT/DTL Series

# Pin Assignments for DB9 and DB25 Connectors



#### Pin Assignments for DB25 Male and Female Connectors



# **B.** Adjustable Pull High/Low Resistors for the RS-485 Port

In some critical environments, you may need to add termination resistors to prevent the reflection of serial signals. When using termination resistors, it is important to set the pull high/low resistors correctly so that the electrical signal is not corrupted. Since there is no resistor value that works for every environment, DIP switches or jumpers are used to set the pull high/low resistor values for each RS-485 port.



# ATTENTION

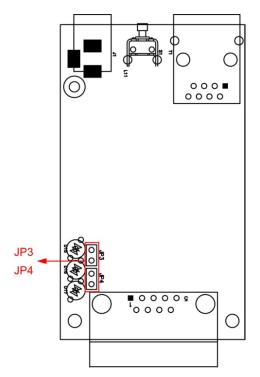
Do not use the 1 k $\Omega$  setting on NPorts when using the RS-232 interface. Doing so will degrade the RS-232 signals and shorten the maximum allowed communication distance.

Series	Pull H/L resistance	Terminator
NPort 5230		
NPort 5232	Fixed, 1 kΩ	N/A
NPort 5232I		
NPort 5130		
NPort 5150		
NPort 5130A	Adjustable, ON = 1 kΩ / OFF = 150 kΩ default = 150 kΩ	N/A
NPort 5150A		
NPort 5450AI-M12		
NPort 5430		
NPort 5450	]	120 Ω
NPort 5430I		
NPort 5450I		
NPort 5630		
NPort 5650		
NPort 5230A	Adjustable, ON = 1 k $\Omega$ / OFF = 150 k $\Omega$	
NPort 5250A	default = 150 k $\Omega$	120 32
NPort 5650-8-DT/DTL		
NPort P5150A		
NPort IA-5150/IA-5250	]	
NPort IA5150A/5250A	]	
NPort IA5450A	]	
NPort IA-5150I		

#### NPort 5130/5150 Series (Jumpers)

To set a pull high/low resistor to 150 k $\Omega$ , make sure that the two jumpers (JP3 and JP4) assigned to the serial port are not shorted by jumper caps. This is the default setting.

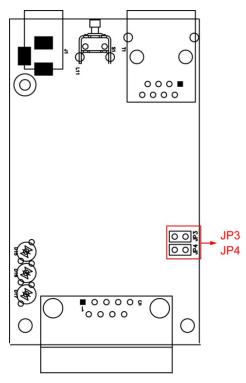
To set a pull high/low resistor to 1 k $\Omega$ , make sure that the two jumpers (JP3 and JP4) assigned to the serial port are shorted by jumper caps.



#### NPort 5130A/5150A (Jumpers)

To set a pull high/low resistor to 150 k $\Omega$ , make sure that the two jumpers (JP3 and JP4) assigned to the serial port are not shorted by jumper caps. This is the default setting.

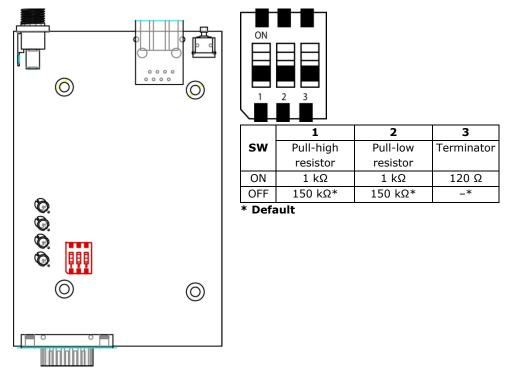
To set a pull high/low resistor to 1 k $\Omega$ , make sure that the two jumpers (JP3 and JP4) assigned to the serial port are shorted by jumper caps.



#### NPort P5150A (DIP Switches)

To set the pull high/low resistors to 150 K $\Omega$ , make sure both the assigned DIP switches are in the OFF position. This is the default setting.

To set the pull high/low resistors to 1 K $\Omega$ , make sure both the assigned DIP switches are in the ON position.



#### NPort 5230/5232/5232I (Fixed)

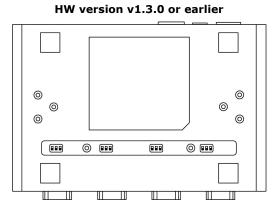
The pull high/low value is 1 K $\Omega$ , and the value is fixed.

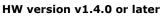
#### NPort 5430/5430I/5450/5450I Models (DIP Switches)

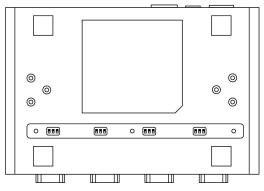
To set the pull high/low resistors to 150 K $\Omega_r$  Pull high/low resistors for the RS-485 Port make sure both of the assigned DIP switches are in the OFF position. This is the default setting.

	SW	1	2	3
	300	Pull High	Pull Low	Terminator
	ON	1 KΩ	1 KΩ	120 Ω
Default	OFF	150 KΩ	150 KΩ	_

To set the pull high/low resistors to 1 K $\Omega$ , make sure both of the assigned DIP switches are in the ON position.







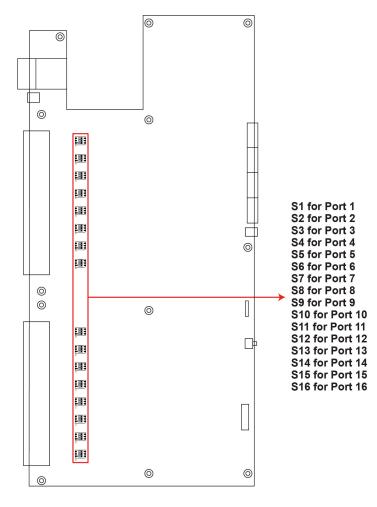
#### NPort 5000 Series User Manual

#### NPort 5630/5650 Series (DIP Switches)

To set the pull high/low resistors to 150 K $\Omega$ , make sure both of the assigned DIP switches are in the OFF position. This is the default setting.

#### To set the pull high/low resistors to 1 K $\Omega$ ,

make sure both of the assigned DIP switches are in the ON position.



#### NOTE

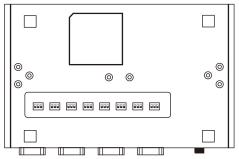
In the NPort 5630 V3.4.0 and later, a DIP switch for the terminator has been added. In the NPort 5650 V1.5.0 and later, a DIP switch for the terminator has been added.

#### To set the pull high/low resistors to 150 K $\!\Omega,\;$ Pull high/low resistors for the RS-485 Port

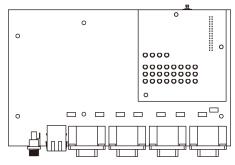
	sw	1	2	3
	300	Pull High	Pull Low	Terminator
	ON	1 KΩ	1 KΩ	120 Ω
Default	OFF	150 KΩ	150 KΩ	-

#### NPort 5650-8-DT/DTL Series (DIP Switches)

• **NPort 5650-8-DT:** Use the DIP switches on the bottom panel to configure each device port's pull high/low resistors. You will need to unscrew the DIP switch cover to access the DIP switches.

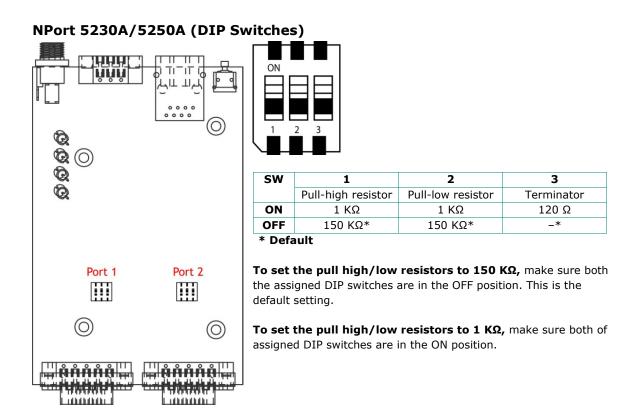


• **NPort 5650-8-DTL:** Remove the top cover to access the DIP switches used to configure each device port's pull high/low resistors (note that SW4 is reserved for future use).



The pull high/low resistor values for each device port are set as follows:

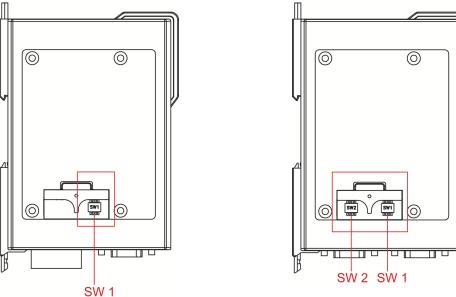
	SW	1	2	3
	300	Pull High	Pull Low	Terminator
	ON	1 KW	1 KW	120 W
Default	OFF	150 KW	150 KW	-



### NPort 5000 Series User Manual

# NPort IA5000 Series (DIP Switches)

NPort IA5150 Models



The DIP switches are located beneath the DIP switch panel on the side of the unit.

To add a 120  $\Omega$  termination resistor, set switch 3 to ON; set switch 3 to OFF (the default setting) to disable the termination resistor.

NPort IA5250 Models

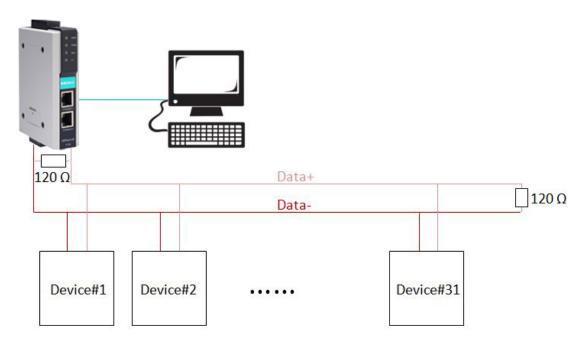
To set the pull high/low resistors to 150 K $\Omega$ , set switches 1 and 2 to OFF. This is the default setting.

To set the pull high/low resistors to 1 K $\Omega$ , set switches 1 and 2 to ON.

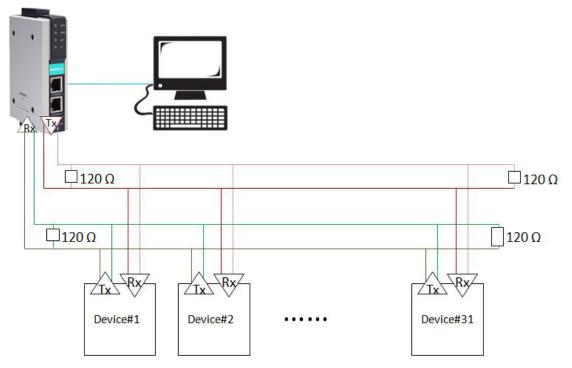
Switch 4 on the port's assigned DIP switch is reserved.

When setting up your RS-485 and RS-422 networks, use termination resistors to prevent signal reflections. The NPort IA5000 Series has built-in pull high/low resistors and terminators, so you can consider enabling them when they have a communication problem by the default settings with RS-485 and RS-422 networks. The following figures illustrate how to properly configure termination for a 2-wire RS-422/RS485 network, and a 4-wire RS485 network. You will usually only need to install termination resistors (typically 120  $\Omega$ ) on the first and last devices on your network.

#### Setting up terminators for a 2-wire RS422/RS485 network



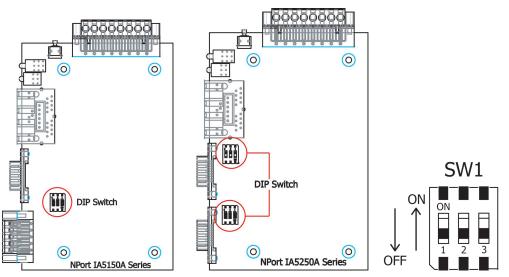
Setting up terminators for a 4-wire RS485 network



#### NPort IA5000A Series (DIP Switches)

The DIP switches are on the PCB board; you will need to take off the covers to access them. To set the pullhigh resistor to 150 K $\Omega$ , flip DIP1 to "OFF," and then set the pull-low resistor to 150 K $\Omega$ , and then flip DIP2 to "OFF." To set the pull-high resistor to 1 K $\Omega$ , flip DIP1 to "ON," and then set the pull-low resistor to 1 K $\Omega$ , and then flip DIP2 to "ON." Make sure that DIP3 is "ON" to enable the 120 $\Omega$  terminator. The default settings for the pull-high and pull-low resistors and the terminators are all at "OFF."





#### NPort IA5450A Series

Follow the instructions below to change the pull-high/low DIP switch settings.

**Step 1:** Remove the case



Step 2: Remove the first tier



Step 3: Remove the 4 pillars



**Step 4:** Pull-high/low DIP switches are on the backside of the board



From right to left, the DIP switches are used for port 1 to port 4. SW1 is used for port 1, SW2 for port 2, SW3 for port 3, and SW4 for port 4. The functions of DIP1, DIP2, and DIP3 are shown in the following table (DIP4 is reserved).

#### Pull-high/low Resistors for the RS-485 Port

	SW	DIP1	DIP2	DIP3
		Pull-high	Pull-low	Terminator
	ON	1 kΩ	1 kΩ	120 kΩ
Default	OFF	150 kΩ	150 kΩ	-

In this appendix, which is included for your reference, we provide a list of well-known port numbers that may cause network problems if you set the NPort to one of these ports. Refer to RFC 1700 for well-known port numbers, or refer to the following introduction from the IANA.

The port numbers are divided into three ranges: the well-known Ports, the Registered Ports, and the Dynamic and/or Private Ports.

- The Well-Known Ports range from 0 through 1023.
- The Registered Ports range from 1024 through 49151.
- The Dynamic and/or Private Ports range from 49152 through 65535.

The well-known ports are assigned by the IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. The following table shows famous port numbers among the well-known port numbers. For more details, visit the IANA website at <a href="http://www.iana.org/assignments/port-numbers">http://www.iana.org/assignments/port-numbers</a>.

TCP Socket	Application Service	
0	reserved	
1	TCP Port Service Multiplexor	
2	Management Utility	
7	Echo	
9	Discard	
11	Active Users (systat)	
13	Daytime	
15	Netstat	
20	FTP data port	
21	FTP CONTROL port	
23	Telnet	
25	SMTP (Simple Mail Transfer Protocol)	
37	Time (Time Server)	
42	Host name server (names server)	
43	Whois (nickname)	
49	(Login Host Protocol) (Login)	
53	Domain Name Server (domain)	
79	Finger protocol (Finger)	
80	World Wide Web HTTP	
119	Network news Transfer Protocol (NNTP)	
123	Network Time Protocol	
213	IPX	
160 - 223	Reserved for future use	

UDP Socket	Application Service
0	reserved
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
35	Any private printer server
39	Resource Location Protocol
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
69	Trivial Transfer Protocol (TETP)
70	Gopler Protocol
79	Finger Protocol
80	World Wide Web HTTP
107	Remote Telnet Service
111	Sun Remote Procedure Call (Sunrpc)
119	Network News Transfer Protocol (NNTP)
123	Network Time Protocol (nnp
161	SNMP (Simple Network Mail Protocol)
162	SNMP Traps
213	IPX (Used for IP Tunneling)

# D. SNMP Agents with MIB II & RS-232/422/485 Like Groups

The NPort has built-in SNMP (Simple Network Management Protocol) agent software. It supports SNMP Trap, RFC1317 RS-232 like group and RFC 1213 MIB-II. The following table lists the standard MIB-II group, as well as the variable implementation for the NPort device server.

System MIB	Interfaces MIB	IP MIB	ІСМР МІВ
SysDescr	itNumber	ipForwarding	IcmpInMsgs
SysObjectID	ifIndex	ipDefaultTTL	IcmpInErrors
SysUpTime	ifDescr	ipInreceives	IcmpInDestUnreachs
SysContact	ifType	ipInHdrErrors	IcmpInTimeExcds
SysName	ifMtu	ipInAddrErrors	IcmpInParmProbs
SysLocation	ifSpeed	ipForwDatagrams	IcmpInSrcQuenchs
SysServices	ifPhysAddress	ipInUnknownProtos	IcmpInRedirects
	ifAdminStatus	ipInDiscards	IcmpInEchos
	ifOperStatus	ipInDelivers	IcmpInEchoReps
	ifLastChange	ipOutRequests	IcmpInTimestamps
	ifInOctets	ipOutDiscards	IcmpTimestampReps
	ifInUcastPkts	ipOutNoRoutes	IcmpInAddrMasks
	ifInNUcastPkts	ipReasmTimeout	IcmpOutMsgs
	ifInDiscards	ipReasmReqds	IcmpOutErrors
	ifInErrors	ipReasmOKs	IcmpOutDestUnreachs
	ifInUnknownProtos	ipReasmFails	IcmpOutTimeExcds
	ifOutOctets	ipFragOKs	IcmpOutParmProbs
	ifOutUcastPkts	ipFragFails	IcmpOutSrcQuenchs
	ifOutNUcastPkts	ipFragCreates	IcmpOutRedirects
	ifOutDiscards	ipAdEntAddr	IcmpOutEchos
	ifOutErrors	ipAdEntIfIndex	IcmpOutEchoReps
	ifOutQLen	ipAdEntNetMask	IcmpOutTimestamps
	ifSpecific	ipAdEntBcastAddr	IcmpOutTimestampReps
		ipAdEntReasmMaxSize	IcmpOutAddrMasks
		IpNetToMediaIfIndex	IcmpOutAddrMaskReps
		IpNetToMediaPhysAddress	
		IpNetToMediaNetAddress	
		IpNetToMediaType	
		IpRoutingDiscards	

#### **RFC1213 MIB-II Supported SNMP Variables:**

UDP MIB	TCP MIB	SNMP MIB	Address Translation MIB
UdpInDatagrams	tcpRtoAlgorithm	snmpInPkts	AtIfIndex
UdpNoPorts	tcpRtoMin	snmpOutPkts	AtPhysAddress
UdpInErrors	tcpRtoMax	snmpInBadVersions	AtNetAddress
UdpOutDatagrams	tcpMaxConn	snmpInBadCommunityNames	
UdpLocalAddress	tcpActiveOpens	snmpInASNParseErrs	
UdpLocalPort	tcpPassiveOpens	snmpInTooBigs	
	tcpAttempFails	snmpInNoSuchNames	
	tcpEstabResets	snmpInBadValues	
	tcpCurrEstab	snmpInReadOnlys	
	tcpInSegs	snmpInGenErrs	
	tcpOutSegs	snmpInTotalReqVars	
	tcpRetransSegs	snmpInTotalSetVars	
	tcpConnState	snmpInGetRequests	
	tcpConnLocalAddress	snmpInGetNexts	
	tcpConnLocalPort	snmpInSetRequests	
	tcpConnRemAddress	snmpInGetResponses	
	tcpConnRemPort	snmpInTraps	
	tcpInErrs	snmpOutTooBigs	
	tcpOutRsts	snmpOutNoSuchNames	
		snmpOutBadValues	
		snmpOutGenErrs	
		snmpOutGetRequests	
		snmpOutGetNexts	
		snmpOutSetRequests	
		snmpOutGetResponses	
		snmpOutTraps	
		snmpEnableAuthenTraps	

### RFC1317: RS-232 MIB objects

Generic RS-232-like Group	RS-232-like General Port Table	RS-232-like Asynchronous Port Group
rs232Number	rs232PortTable	rs232AsyncPortTable
	rs232PortEntry	rs232AsyncPortEntry
	rs232PortIndex	rs232AsyncPortIndex
	rs232PortType	rs232AsyncPortBits
	rs232PortInSigNumber	rs232AsyncPortStopBits
	rs232PortOutSigNumber	rs232AsyncPortParity
	rs232PortInSpeed	
	rs232PortOutSpeed	

The Input Signal Table	The Output Signal Table
rs232InSigTable	rs232OutSigTable
rs232InSigEntry	rs232OutSigEntry
rs232InSigPortIndex	rs232OutSigPortIndex
rs232InSigName	rs232OutSigName
rs232InSigState	rs232OutSigState

The NPort Series provides several ways to configure Ethernet IP addresses. One of them is DHCP Client. When you set up the NPort to use DHCP Client to configure Ethernet IP addresses, it will automatically send a DHCP request over the Ethernet to find the DHCP Server. And then the DHCP Server will send an available IP address to the NPort. The NPort will use this IP address for a period after receiving it. But the NPort will send a DHCP request again to the DHCP Server. Once the DHCP Server realizes that this IP address is to be released to another DHCP Client, the NPort then will receive a different IP address. For this reason, users sometimes find that the NPort will use different IP addresses, not a fixed IP address.

In order to know what IP address the NPort is using, you need to set up parameters in Network Settings via the Web browser. The figure below is the NPort Web console configuration window. Enter the IP address and the Port number of the PC that you want to send this information to.

Network Settings	
AN1 IP address	192.168.127.254
LAN1 Netmask	255.255.255.0
AN1 Gateway	
AN1 IP configuration	Static \$
fulti-LAN mode	Switch \$
LAN2 IP address	192.168.126.254
LAN2 Netmask	255.255.255.0
AN2 Gateway	
LAN2 IP configuration	Static \$
ONS server 1	
DNS server 2	
IP Address Report	
Auto report to IP	
Auto report to IP (LAN2)	
Auto report to UDP port	4002
Auto report period	10 (0~99 secs)
LLDP Settings	
LLDP	Enable O Disable
Message Transmit Interval	30 (5~32768 secs)

And then you can develop your own programs to receive this information from the NPort. Here is NPort's Auto IP Report Protocol. We provide an example for you to easily develop your own programs. You can find this example on Moxa's website.

#### **Auto IP Report Format**

"Moxa", 4 byte	es	Info[0]	Info[1]		Info[n]
Info [n]					
Field	ID	Length	1	Data	
Length	1	1		Variable, Len	ngth is "Length Field"

### ID List

ID Value	Description	Length	Note
1	Server Name	Variable	ASCII char
2	Hardware ID	2	Little-endian
			6 bytes MAC address. If the MAC address is
3	MAC Address	6	"00-90-E8-01-02-03", the MAC[0] is 0, MAC[1]
			is 0x90(hex), MAC[2] is 0xE8(hex), and so on.
4	Serial Number	4, DWORD	Little-endian
5	IP Address	4, DWORD	Little-endian
6	Netmask	4, DWORD	Little-endian
7	Default Gateway	4, DWORD	Little-endian
8			Little-endian
	Firmware Version	4, DWORD	Ver1.3.4= 0x0103040
9	AP ID	4, DWORD	Little-endian

#### AP ID & Hardware ID Mapping Table

Product	Device ID	AP ID
NPort 5110	0x5110	0x80015110
NPort 5130	0x5130	0x80005100
NPort 5150	0x5150	0x80005100
NPort 5110A	0x511A	0x80015100
NPort 5130A	0x513A	0x80015100
NPort 5150A	0x515A	0x80015100
NPort 5210	0x0322	0x80000312
NPort 5230	0x0312	0x80000312
NPort 5232	0x0332	0x80000312
NPort 5232I	0x1332	0x80000312
NPort 5210A	0x521A	0x80015200
NPort 5250A	0x525A	0x80015200
NPort 5410	0x0504	0x80005000
NPort 5410 v3	0x05401	0x80005400
NPort 5430	0x0534	0x80005000
NPort 5430 v3	0x05402	0x80005400
NPort 5430I	0x1534	0x80005000
NPort 5430I v3	0x5403	0x80005400
NPort 5450 v3	0x5404	0x80005400
NPort 5450-T v3	0x5406	0x80005400
NPort 5450I v3	0x5405	0x80005400
NPort 5450I-T v3	0x5407	0x80005400
NPort 5610-8	0x5618	0x80005610
NPort 5610-16	0x5613	0x80005610
NPort 5630-8	0x5638	0x80005610
NPort 5630-16	0x5633	0x80005610
NPort 5610-8-DT	0x5700	0x80015610
NPort 5650-8-DT	0x5702	0x80015610
NPort 5650I-8-DT	0x5703	0x80015610
NPort 5610-8-DT-J	0x5704	0x80015610
NPort 5650-8-DT-J	0x5706	0x80015610
NPort 5150AI-M12	0x515B	0x80015101
NPort 5250AI-M12	0x525B	0x80015201
NPort 5450AI-M12	0x545B	0x80015401
NPort-IA5150	0x5151	0x80005250
NPort-IA5150I	0x5152	0x80005250
NPort-IA5150-S-SC	0x5152	0x80005250
NPort-IA5150I-S-SC	0x5155	0x80005250
NPort-IA5150-M-SC	0x5155	0x80005250
NPort-IA5150I-M-SC	0x5155	0x80005250
NPort-IA5250	0x5251	0x80005250
NPort-IA5250I	0x5250	0x80005250
	0,5250	0700003230

Product	Device ID	AP ID
NPort IA5150A	0x527A	0x80005201
NPort IA5150A-M-SC	0x52BA	0x80005201
NPort IA5150AI	0x528A	0x80005201
NPort IA5250A	0x529A	0x80005201
NPort IA5250AI	0x52AA	0x80005201
NPort IA5450A	0x540A	0x80015400
NPort IA5450AI	0x541A	0x80015400
NPort P5150A	0x5157	0x80015100

# 

# **CE Warning**

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take appropriate measures.

#### **Federal Communications Commission Statement**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

# <u>Γ</u> Γ

### FCC Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

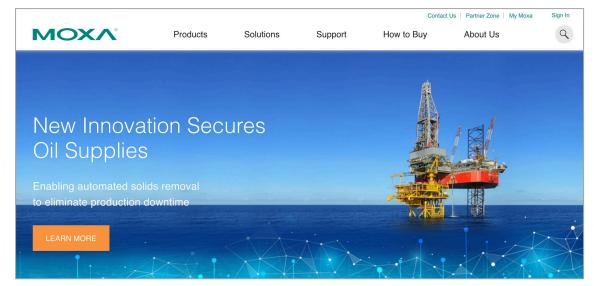
# G. How to Become a Registered User on the Moxa Website

Why you should become a Moxa.com registered user, it benefits you to receive all updates of your purchased or interested products, including software such as firmware, driver, and documentation, like datasheet, Quick Installation Guide (QIG).

To become a registered user and receiving all updates, you need to do following:

#### **Register a Moxa account**

1. Go to Moxa.com and click 'Sign in' at the top-right corner.



2. In the sign-in page, click "Create your Moxa member account" at below.

Please sign in	
Email*	
Password*	
Forgot your password?	
SIGN IN	
Not a member? Create your Moxa member account	

#### 3. Fill up the necessary fields.

Create New Account	
Work Email*	
First Name*	Last Name*
Company*	
Phone*	
Region*	
Select	•
Please input a password*	

### **Request for product updates**

1. Go to the product's page that you would like to receive updates, click "+FOLLOW UPDATE"

Home > Products > Industrial Edge Connectivity > Serial Device Servers > General Device Servers > NPort 5100A Series NPort 5100A Series 1-port RS-232/422/485 serial device servers with serial surge protection				
Q	<ul> <li>Features and Benefits</li> <li>Power consumption of only 1 W</li> <li>Fast 3-step web-based configuration</li> <li>Surge protection for serial, Ethernet, and power</li> <li>COM port grouping and UDP multicast applications</li> <li>Screw-type power connectors for secure installation</li> <li>Real COM and TTY drivers for Windows, Linux, and macOS</li> <li>Standard TCP/IP interface and versatile TCP and UDP operation modes</li> <li>Connects up to 8 TCP hosts</li> </ul>			
	GET A QUOTE + FOLLOW UPDATES			

2. Once completes, see the FOLLOW UPDATES button changes.

GET A QUOTE	0