# **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 5110/5130/5150 Series	NPort 5000 Series device servers make
	NPort 5210/5230/5232 Series	serial devices network-ready in an
NPort 5000	NPort 5410/5430/5450 Series	instant. The different form factors of the
	NPort 5610/5630/5650 Series	servers provide flexible options for users
	NPort 5610-8-DT/5650-8-DT Series	to connect legacy devices to an IP-based
	NPort 5610-8-DTL/5650-8-DTL Series	Ethernet LAN.
		The NPort 5000A device servers make
	NPort 5110A/5130A/5150A Series	serial devices network-ready in an instant
	NPort 5210A/ 5230A/5250A Series	and give your PC software direct access
NPort 5000A	NPort 5150AI-M12/5250AI-M12/5450AI-M12	to serial devices from anywhere on the
NPOIL JUUUA	Series	network. The NPort 5000A device servers
	NPort P5150A Series	are ultra-lean, rugged, and user-friendly,
	NPOIL PSISOA Series	making simple and reliable serial-to-
		Ethernet solutions possible.
		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,
NPort	NPort IA5150/IA5250 Series	barcode readers, and operator displays.
IA5000/IA5000A	NPort IA5150A/IA5250A/IA5450A Series	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
	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
₩ V+ V- ⊕ 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	
		Dilliking.	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	Steady on.	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.	
		Blinking:	The Ethernet port is connected, and data is being transmitted at	
		Billinning.	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	r 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		
		billikilig.	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.		
	orange	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		
(Lenemet)	Green	Steddy on.	data is NOT being transmitted.		
	Green	Blinking:	The Ethernet port is connected, and data is being transmitted at		
		Dinking.	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	Blinking:	The device server has been located by NPort Administrator's	
		biinking:	Location function.	
	Off	Power is 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	rt is transmitting data.	
FI 10 FI0	Off	Data is NOT	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	The Ethernet port is connected, and data is being transmitted.	
	Off	The Ethernet port is disconnected.		
	Green	Power cable is connected and provides electricity properly.		
PWR Off Power cable is disconnected.		is disconnected.		

## NPort 5600-8-DT/DTL Series

LED Name	LED Color	LED Function		
PWR	Red	Power is on.		
PVVK	Off	Power is off.		
		Steady on:	The NPort is operational.	
Deedu	Green	Dlinking	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 ha	as been opened by server side software.	
(P1 to P8) Off Serial port is not currently opened by host side softwa		not currently opened by host side software.		
Tv /Dv	Green (Tx)	Serial device	Serial device is transmitting data.	
Tx/Rx (P1 to P8)	Orange(Rx)	Serial device	is receiving data.	
(FI (0 PO)	Off	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.	
	Orange	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.	
		Blinking:	The Ethernet port is connected, and data is being transmitted at	
		Diffiking.	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	The serial port 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.	
		biirikiriy.	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	Blinking:	The device server has been located by the 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	Plinking	The Ethernet port is connected, and data is being transmitted at	
		Blinking:	10 Mbps.	
E1, E2		Steady on:	The device is connected to a 100 Mbps Ethernet connection, but	
	Green		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.	
P1, P2,	Orange	The serial port 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.	
LV	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**

1. 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	<u>? ×</u>
General Security Content Connections Programs Advanced		Settings:	
Select a Web content zone to specify its security settings.	-	Cookies     Cookies     Allow cookies that are stored on your computer     O Disable     O Enable	
Internet Internet Internet Sites Internet Sites Internet Sites Internet Sites Internet Intern		Prompt     Allow per-session cookies (not stored)     Disable     Enable     Prompt	
Security level for this zone Move the slider to set the security level for this zone. - I - Medium - Safe browsing and still functional - I - Prompts before downloading potentially unsafe content - Unsigned ActiveX controls will not be downloaded - Appropriate for most Internet sites	:	Control of Contro of Control of Control of Control of Control of Control of Control	•
Custom Level Default Level		Reset custom settings Reset to: Medium Reset	
OK Cancel Ap	ply	OK Canc	el

- 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 : ****** Submit	

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



#### **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	/eb Console - Microsoft Internet Explorer		
Ele Edit View Favorites Tool	; Help		
🌏 Back 🔹 🕥 🖌 💌 💋 🔮	🏠 🔎 Search 🛛 👷 Favorites 🛭 🍯	Neda 🧭 🔗 🧏	2
	88.127.254/home.htm?Password=731a9e0a41ba3bb0a27ca8b330c239db85ubmit=Submit		
,			
	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,	default gateway, static I	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 E-Mail, SNMP Trap server IP address, Relay Output.		

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

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

Model	NPort IA5450AI
Name	NPIA5450AI_11625
Serial NO.	11625
Firmware	1.6 Build 19013022
IP	192.168.127.254
Mac Address	00:90:E8:4D:A9:6F
Up Time	0 days 01h:18m:37s
Serial Port 1	115200,None,8,1
Serial Port 2	115200,None,8,1
Serial Port 3	115200,None,8,1
Serial Port 4	115200,None,8,1



# 

#### ATTENTION

Overview Quick Setup Basic Settings Network Settings - Serial Settings - Operating Settings Accessible IP Settings - Administration - Backup/Restore System Log Settings - Auto Warning Settings System Log Event setting 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.

Step 1/3		
Server Settings		
Server name	NPIA5450AI_6671	
Network Settings	Static	
IP address	192.168.127.135	
Netmask	255.255.255.0	
	1	
Gateway		
Gateway		

## 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 COM port.	
Remember to install Real COM/TTY driver on PC. For detail i	nformation please refer to User's Manual.
• тср	
PC communicate with serial device through TCP port.	
Device is TCP client	
Destination IP address	Port 4001
O UDP	
PC communicate with serial device through UDP port.	
Destination IP address Port 4001	

## 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.

Your changes have not l	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 <mark>–</mark>	
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 Tim	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
Teinet 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	77665544	
Time Settings			
Time zone	(OUT)Our welch Mar	- Tess Dable Edisburgh Lister Law	
	<u></u>	an Time: Dublin, Edinburgh, Lisbon, Lon	idon V
Time	2020 / 9 / 6 2	3 : 56 : 11 Modify	
Time server			
Daylight Saving Time Settings			
	Month	Week Day	Hour
Start Date	- 🗸	- •	- 🗸
End Date	- •		- 🗸
Offset	0 v hour(s)		
	lo i hou(o)		
Console Settings			
HTTP console	O Enable	Disable	
HTTPS console (support TLS v1.2)	Enable	O Disable	
TLS v1.0/v1.1 for HTTPS console	O Enable	Oisable	
Telnet console	O Enable	Oisable	
Serial console	O Enable	Disable	
Moxa Service	Enable	Oisable	
Maximum Login Users For HTTP+HTT			
Auto Logout Setting (min)	1440 (1~1440)		
Reset button protect	No	O 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 5100/5100A/5200/5200A Series	No.] GMT (Greenwich Mean Time)	different NPorts. 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 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**

Web Interface for the	e NPort 5100, NPort 5200	, and NPort IA5000 Series Only
MOXA	www.moxa	.com
Main Menu     Overview     Basic Settings     Network Settings     Serial Settings	Network Settings	192.168.127.254
	Netmask	255.255.255.0
Operating Settings     Accessible IP Settings     Accessible IP Settings     Auto Warning Settings	Gateway IP configuration	Static
Monitor     Change Password     Load Factory Default	DNS server 1 DNS server 2	
Save/Restart	SNMP Community name	SNMP Setting
	Contact Location	
	Auto report to IP	IP Address report
	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 IP 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	Enable  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.

Neb Interface for th	e Overall NPort 5000	Series	
	SNMP Agent Se	ettings	
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 Loa Settinas			

#### **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	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>

			1	1	1			
ort	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.

		00, and IA5000 Series Only
MOXA	www.mox	(a.com
🔄 Main Menu	Serial Settings	
Overview		Port 1
Basic Settings     Network Settings	Port alias	
Serial Settings		Serial Parameters
Dort 1	Baud rate	115200 👻
Port 2	Data bits	8
Port 3	Stop bits	1 •
Port 5	Parity	None 💌
Port 6	Flow control	RTS/CTS 🖌
Port 7	FIFO	Enable O Disable
Operating Settings	Interface	RS-232
Accessible IP Settings	Apply the above settings to	all serial ports
Auto Warning Settings     Monitor		Submit

-Serial Settin	gs				
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	
Apply the above settings 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	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

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	112			
Port	Operating mode	Packing length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit		
1		0	0 (Disable)	0 (Disable)	Do Nothing	D		
1	Real COM Mode	TCP alive check time: 7 Max connection: 1						
1	19. August	0	0 (Disable)	0 (Disable)	Do Nothing	0		
2	Real COM Mode	TCP alive ch Max connect						

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

rview	Port	Operating Mode	Packing Length	Delimiter 1		Delimiter 2	Delimiter Process	Force Transmit
k Setup				0 (Disable)		0 (Disable)	Do Nothing	0
c Settings	1	RealCOM	TCP alive check time:	- (2.020)	7	- (2.5555.57)		-
ork Settings	1 - Y		Max connection:		1			
ial Settings					1			
ort 1			0	0 (Disable)		0 (Disable)	Do Nothing	0
_	2	RealCOM	TCP alive check time:		7			
ort 2			Max connection:		1			
ort 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:		4			

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

• Operation Mo	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 \$ (Prod	cessed only when pac	king length is 0)		
Force transmit	0 (0 - 65535 ms)				
	✓ P1	□ P2	<b>P3</b>	<b>P4</b>	
Apply the above settings to					

# Accessible IP Settings

Web Interface for t	he N	Port 5100, 5200, a	nd IA5000 Series Only		
MOXA		www.moxa	com		
Main Menu	Acc	essible IP Setting	S		
Basic Settings					
🚨 Network Settings	E E	nable the accessible IP	list (Not checking "Enable"	will allow all IPs to connect.)	
Serial Settings Operating Settings	No.	Activate the rule	IP Address	Netmask	
Port 1	1				
Port 2	2	Г			
Accessible IP Settings	2	Γ			
🗉 🗋 Monitor	4				
Change Password	5	<b>F</b>			
Save/Restart	6				
	7	Γ			
	8	Γ			
	9	Γ			
	10				

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

verview				
uick Setup	C Act	ivate the accessible IP	list (Operation modes are NO	OT allowed for the IPs NOT on the list)
asic Settings	Ap	oly additional restriction	ns (All device services are NC	OT allowed for the IPs NOT on the list)
etwork Settings				
Serial Settings	No.	Activate the rule	IP Address	Netmask
Operating Settings	1			
ccessible 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			
pgrade Firmware	9			
Monitor	10			
hange Password	11			
bad 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
NP011 5400	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
NFOIL IAJUUUA	NPort IA5450A models	All revisions	v1.7
	All	HW Rev 1.x	v1.7
NPort IA5000	АП	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	• • • • •	- 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 re se File No file chosen	start 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		5.

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	evice Networking		www.moxa.com
		Usemame: Password:		
		L	ogin	
	Welcome to NPort			

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

## **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 🧿 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	🔵 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	LIIdDie/Disable	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		enabled	the lockout
	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.

eb Interface for the NPort 5100, 5200, IA5000 Series					
MOXA www.moxa.com					
Main Menu	Auto warning: Email ar	nd SNMP trap			
Overview Basic Settings		Mail server			
Network Settings	Mail server				
Serial Settings	My server requires authentication				
Port 2	User name				
Coperating Settings	Password				
Port 1	From E-mail address	NPIA-5250_525016@moxa.com			
Accessible IP Settings	E-mail address 1				
Auto Warning Settings	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			

	• E-mail and SNMP Trap Settings		
Dverview	Mail Server		
Quick Setup Basic Settings			
Vetwork Settings	Mail server		
Serial Settings	My server requires authentication		
- Operating Settings	User name		
Accessible IP Settings	Password		
- Administration			
Backup/Restore	From E-mail address	NPort@moxa	
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			
Upgrade Firmware			
- Monitor	SNMP Trap Server		
Line	SNMP trap server IP or domain name		
Async	Trap version	v1 ○ v2c	
Async-Settings			
Relay Output	Trap community	public	
System Log			
Change Password	Submit		

#### **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.	
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	I Mail	T Trap	
Authentication failure	🗖 Mail	🗖 Trap	
IP address changed	T Mail		
Password changed	Mail		
Power failure	🗖 Mail		Relay Output
Ethernet1 link down	🗖 Mail	Trap	Relay Output
Ethernet2 link down	🗖 Mail	T Trap	Relay Output
	D	CD changed	
Port 1	🗖 Mail	🗖 Trap	🗖 Relay Output
Port 2	T Mail	T Trap	Relay Output
	C	)SR changed	
Port 1	I Mail	🗖 Trap	Relay Output
Port 2	🗖 Mail	Trap	Relay Output

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

	<b>•</b> Event Setting	gs		
verview	System Event			
uick Setup				
asic Settings	Cold start	Mail	Trap	
etwork Settings Serial Settings	Warm start	Mail	Trap	
Operating Settings				
ccessible IP Settings	Config Event			
Administration		O M-8	- <del>-</del>	
Backup/Restore	Authentication failure	🗌 Mail	Trap	
ystem Log Settings	IP changed	Mail		
Auto Warning Settings	Password changed	Mail		
System Log Event settings	Power failure	Mail		Relay output
E-mail and SNMP Trap	Ethernet1 link down	Mail	Trap	Relay output
Event Type	Ethernet2 link down	Mail	Trap	Relay output
grade Firmware				
fonitor	DCD Changed			
ine	DCD Changed			
sync	Port 1	🗌 Mail	Trap	Relay output
Async-Settings	Port 2	🗌 Mail	Trap	Relay output
Relay Output System Log	Port 3	Mail		Relay output
ange Password	Port 4	Mail		Relay output
ange Password ad Factory Default	POIL4			
e/Restart				
out	DSR Changed			
	Port 1	🗌 Mail	🗌 Тгар	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	n	
Main Menu	Monitor Relay Output		
Overview     Basic Settings		Relay Output Status	
Network Settings	Power failure	1777	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)	222	Acknowledge Event

#### Web Interface for the NPort IA5000A Series

	: Dout State		
Overview	Dout Status		
Quick Setup			
Basic Settings	Power failure	-	Acknowledge Event
Network Settings	Ethernet1 link down	-	Acknowledge Event
- Serial Settings	Ethernet2 link down	-	Acknowledge Event
- Operating Settings	DCD changed (Port 1)		Acknowledge Event
Accessible IP Settings	DSR changed (Port 1)		Acknowledge Event
- Administration		-	
- Account Management	DCD changed (Port 2)	-	Acknowledge Event
SNMP Agent	DSR changed (Port 2)		Acknowledge Event
- Backup/Restore	DCD changed (Port 3)	-	Acknowledge Event
System Log Settings	DSR changed (Port 3)		Acknowledge Event
- Auto Warning Settings	DCD changed (Port 4)		Acknowledge Event
System Log Event settings			
E-mail and SNMP Trap Event Type	DSR changed (Port 4)	-	Acknowledge Event
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.

MOXA		www.mo	xa.com							
Main Menu	Monit	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	Port Operation Mode	Connections			
Quick Setup		[Listen]	[]	[]	[ ]
Basic Settings	1 RealCOM	[ ]		[]	
Network Settings	a	[Listen]	[ ]	[ ]	[]]
- Serial Settings	2 RealCOM	[ ]	[ ]	[ ]	[ ]
Port 1	3 RealCOM	[Listen]	[ ]	[ ]	[ ]
Port 2	5 RealCOW	[]	[ ]	[ ]	[ ]
Port 3 Port 4	4 RealCOM	[Listen]	[ ]	[ ]	[ ]
- 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.n	noxa.co	m						
Main Menu	Monito	r Async								
Overview Basic Settings	Async									
	Port	TxCnt	RxCnt	TxTotalCnt	RxTotalCnt	DSR	CTS	DCD		
Network Settings	PORC	Lawing								
Network Settings	1	0	0	0	0	OFF	OFF	OFF		
Serial Settings	1 2		0	0	0	OFF	OFF			
	1 2 3	0	0	0 0 0	0 0 0			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	•	۲	۲	۹	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.

MOXA		www.mo	xa.com							
Main Menu	Monito	r Async-Setting	S							
Basic Settings	Async-Settings									
Network Settinas	Port	Baud rate	Data bits	Stop bits	Parity	FIFO	RTS/CTS	XON/XOFF	DTR/DSR	
Serial Settings	1	115200	8	1	None	Enable	OFF	OFF	OFF	
Operating Settings	2	115200	8	1	None	Enable	OFF	OFF	OFF	
Accessible IP Settings	3	115200	8	1	None	Enable	OFF	OFF	OFF	
Auto Warning Settings	4	115200	8	1	None	Enable	OFF	OFF	OFF	

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

		:•Mo	nitor A	Async-	Sett	ings				
Overview	Port	Baud		Stop Bits			Flow Contro	Flow Control		
Quick Setup		Rate	Data Bits		Parity		1		FIFO	Interface
Basic Settings							XON/XOFF			
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										
<ul> <li>Auto Warning Settings</li> </ul>										
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.
LUCAILUY	Reep the log in the hash of NPOIL 5000 up to 512 items.

#### System

o yotem	
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										
🗉 🧰 Operating Settings	Retype password :									
Carta Accessible IP Settings										
🖻 🔄 Auto Warning Settings	Submit									
Long and and output they										

	- Change Pa	issword	
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

eb	Interface for the NPort 5100, 5200, and IA5000 Series Only
	www.moxa.com
oa	d Factory Default
	function will reset all MOXA NPort Server settings to their factory default values. Be aware that previous settings e lost.
	Submit
ah	Interface for the Overall NPort 5000 Series
eD	
	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

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**.



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	N 1997
Communication Parameter	Terminal File Transfer Capturing
COM Options Ports : Baud Rate : Data Bits : Parity :	COM1
Stop Bits :	1 •
Row 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**.

PComm Terminal Emulator - COM1,19200,None,8,1,Dumb Terminal		-		X
S COM1, 19200, None, 8, 1, Dumb Terminal		0		×
Bodel name : NFort 5250A				^
DTR Flease keyin your username: ATS				1
Please keyin your password:				
	74400	04.40	0	~
State:OPEN	TX:122	RX:10	18	1

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>84 -</u>		×
Profile Edit Port Manager Window Help			
🗐 🖬 🛃 🔄 📚 Brk 📾 🛣 28 HEX			
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 IP 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	5	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>	<ul> <li>✓</li> </ul>	<ul> <li>✓</li> </ul>		<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.

	✓	✓		<b>√</b>			$\checkmark$	Inactivity time
Real COM Mode	TCP Server Mode	TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Inactivity time Setting Options: 0 to 65535 ms Default: 0 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. 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). 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.
			1			1	1	Mana and a shi a s
Real COM Mode	✓ TCP Server Mode	✓ TCP Client Mode	UDP Mode	Reverse Telnet Mode	Pair Connection Mode	RFC2217 Mode	PPP Mode	Max connection Setting Options: 1 to 8 (1 to 4 for the NPort 5100/NPort 5200/NPort 5400 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. Ignore jammed IP
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: This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the device port (see Max connection). <b>Yes</b> means that transmission to the other hosts will not be suspended if one IP address becomes unresponsive. <b>No</b> means that all transmission will be suspended if one IP address becomes unresponsive and will resume when all hosts have responded. <b>Yes</b> is the recommended setting when Max connection is 2 or more.
✓	$\checkmark$							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	Delimiter 1 and 2Setting Options: Enable, 0 to FFDefault: DisableDescription: Controls data packing using special delimitercharacter(s).Serial data accumulates in the device port's buffer until the delimitercharacter(s) are received, after which the data is packed fornetwork transmission. If only one delimiter character is needed, besure to enable Delimiter 1 only. If both Delimiter 1 and 2 areenabled, both characters must be received in sequence for datapacking to occur. For example, the carriage return character couldbe used as a delimiter in order to transmit each sentence orparagraph in a separate packet. Data is packed according to theDelimiters must be incorporated into the data stream at thesoftware or device level.



#### 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>Image: A start of the start of</li></ul>			<b>√</b>		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.

					<ul> <li>Image: A second s</li></ul>		<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.
				1	1			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.

Oper	ating Settings											
			Operating S	ettings								
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 check time: 7 Max connection: 1										
		0	0 (Disable)	0 (Disable)	Do Nothing	0						
2	Real COM Mode		TCP alive check time: 7 Max connection: 1									

		- 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		RealCOM	0	0 (Disable)		0 (Disable)	Do Nothing	0
Port 1 Port 2	2		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			

### **Real COM Mode**

Main Menu	Operating Settings					
Overview Basic Settings		Port=01				
Network Settings	Operation mode	Real COM Mode				
Serial Settings	TCP alive check time	7 (0 - 99 min)				
Operating Settings Port 1	Max connection	1 💌				
Port 2	Ignore jammed IP	No Yes				
Dort 3	Allow driver control	No Yes				
Port 4	Data Packing					
Accessible IP Settings	Packing length	0 (0 - 1024)				
Auto Warning Settings Monitor	Delimiter 1	0 (Hex) Enable				
Change Password	Delimiter 2	0 (Hex) Enable				
🔲 Load Factory Default	Delimiter process	Do Nothing 🔮 (Processed only when Packing length is 0)				
Save/Restart	Force transmit	0 (0 - 65535 ms)				
	Apply the above settings to all serial ports					

#### Web Interface for the Overall NPort 5000 Series **:**•Operation Modes Port 1 RealCOM Operation mode \$ TCP alive check time 7 (0 - 99 min) Max connection 1 \$ No Yes Ignore jammed IP Allow driver control No Yes Data Packing 0 (0 - 1024) Packing length 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 ms) ✓ P1 🗆 P3 🗆 P4 P2 Apply the above settings to All ports Submit

Parameter		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 (1 to 4 for the NPort 5100/ NPort 5200/ NPort 5400 Series only)	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, 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 from the Ethernet interface.</li> </ul>	Required
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
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

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.	



### 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	noxa.com
Main Menu	Operating Settings	9
Overview		Port 1
Basic Settings Network Settings	Operation mode	RFC 2217 Mode
Serial Settings	TCP alive check time	
Operating Settings	TCP alive check dhie	7 (0 - 99 min) Data Packing
Port 1	Dealling locath	
Dort 2	Packing length	0 (0 - 1024)
Dort 3	Delimiter 1	0 (Hex) Enable
Dort 4	Delimiter 2	0 (Hex) Enable
Port 5	Delimiter process	Do Nothing Y (Processed only when Packing length is 0)
Port 6	Force transmit	0 (0 - 65535 ms)
Port 8		
Accessible IP Settings	Apply the above set	ungs to all senal ports
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	)		
Delimiter 1	00 (Hex) 🗆 E	nable		
Delimiter 2	00 (Hex) E	nable		
Delimiter process	Do Nothing	(Processed only v)	when packing length is	0)
Force transmit	0 (0 - 655	35 ms)		
Apply the above settings to	P1 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 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**

MOXA	www.mo>	ka.com
Main Menu	Operating Settings	
Basic Settings	Operation mode	Port=01 TCP Server Mode
Network Settings Serial Settings	TCP alive check time	
Carlo Settings		7 (0 - 99 min)
Dort 1	Inactivity time	0(0 - 65535 ms)
Dort 2	Max connection	1 💌
- Port 3	Ignore jammed IP	No Yes
Port 4	Allow driver control	No Yes
Accessible IP Settings		Data Packing
Can Monitor	Packing length	0 (0 - 1024)
Change Password	Delimiter 1	0 (Hex) Enable
🔁 Load Factory Default	Delimiter 2	0 (Hex) Enable
- Save/Restart	Delimiter process	Do Nothing V (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 to	all serial ports (Local listen port will be enumerated automatically).
		Submit

#### Web Interface for Overall NPort 5000 Series

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)			
Facking length				
	00 (Hex)  Enable			
Delimiter 1	00 (Hex) Enable			
Delimiter 1 Delimiter 2 Delimiter process	00 (Hex) Enable	ssed only when	packing length is	s 0)
Delimiter 1 Delimiter 2	00 (Hex) Enable	ssed only when	packing length is	s 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>	
Parameter	Setting	Factory Default	Description	Necessity
---------------------------------	--	--------------------	---	-----------
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 in 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.</li> <li>If the inactivity time is set to 0, the current TCP 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> <i>Connection</i>	1 to 8 (1 to 4 for the NPort 5100/ NPort 5200/ NPort 5400 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
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

Parameter	Setting	Factory Default	Description	Necessity
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	
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**

MOXA	www.mo	xa.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 Port 1	Inactivity time	0 (0 - 65535 ms)							
Port 2	Ignore jammed IP	⊙No OYes							
Port 3	Data Packing								
Port 4	Packing length	0 (0 - 1024)							
Monicor	Delimiter 1	0 (Hex) Enable							
	Delimiter 2	0 (Hex) Enable							
	Delimiter process	Do Nothing Y (Processed only when Packing length is 0)							
	Force transmit 0 (0 - 65535 ms)								
	TCP Client Mode								
	Destination IP address 1	Destination IP Address 4001							
	Destination IP address 2	4001							
	Destination IP address 3	4001							
	Destination IP address 4	4001							
	Designated Local Port 1	5011 (0 - 65535, 0 represents assigned automatically.)							
	Designated Local Port 1	5012 (0 - 65535) (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 settings to								

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 when pack	ing 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
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 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	Required
address 2/3/4	,		applications, the user may need to send the data actively to the remote destination domain name.	
Designated Local Port 1/2/3/4	TCP Port No.	5011 (Port 1) 5012 (Port 2) 5013 (Port 3) 5014 (Port 4)	N/A	Required
Connection control	Startup/None, Any Character/ None, Any Character/ Inactivity Time, DSR ON/ DSR OFF, DSR ON/None, DCD ON/ DCD OFF, DCD ON/None	Startup/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 UIJDSK UII	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
DSR UN/NUTE	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
DCD ON NOTE	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	P2	🗆 P3		<b>P4</b>		
	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	<ul> <li>O: Disable the force transmit timeout.</li> <li>1 to 65535: Forces the NPort's TCP/IP protocol software to pack serial data received during the specified time into the same data frame.</li> <li>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</li> </ul>		
Destination IP address 1	IP address range E.g., Begin:	Begin: Empty	specified under Force Transmit timeout.	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	Por	rt
estination IP address 1	239.1.1.1		: 4001	
stination IP address 2			: 4001	
estination IP address 3			: 4001	
estination IP address 4			: 4001	
			. 4001	
ocal listen port	4001		. 4001	
icking length	4001 0 (0 - 1024)		. 1001	
ata Packing cking length		able		
ata Packing cking length limiter 1	0 (0 - 1024)			
ata Packing	0 (0 - 1024) 00 (Hex) Ena 00 (Hex) Ena			
ata Packing cking length limiter 1 limiter 2	0 (0 - 1024) 00 (Hex) Ena 00 (Hex) Ena	able (Processed only wh		

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							
Main Menu	Operating Settings						
Basic Settings Network Settings	Port=1						
<ul> <li>Network Settings</li> <li>Serial Settings</li> </ul>	Operation mode	Pair Connection Master Mode -					
Coperating Settings	TCP alive check time	7 (0 - 99 min)					
Port 1	Destination IP address	192.168.1.1 : 4001					
	□ Apply the above settings	s to all serial ports					
	* 🖬 Auto Warning Setting:						
Monitor     Ghange Password		Submit					
Load Factory Default							

# Web Interface for the Overall NPort 5000 Series

• Operation Modes							
Port 1							
Operation mode	Pair Connectio	n Master \$					
TCP alive check time	7 (0 - 99 min	)					
Destination IP address			Port 40	101			
Apply the above settings to	✓ P1 All ports	□ P2	□ P3	□ P4			
Submit							

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 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						
Basic Settings Network Settings	Port=1						
Serial Settings	Operation mode	Pair Connection Slave Mode 💌					
Coperating Settings	TCP alive check time	7 (0 - 99 min)					
Port 1	Local TCP port	4001					
	G Apply the above settings to all serial ports						
Auto Warning Setting							
Monitor Change Password		Submit					

Web Interface for the Overall NPort 5000 Series
---

• Operation M	lodes			
Port 1				
Operation mode TCP alive check time	Pair Connectio			
Local TCP port	4001			
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 closes the TCP connection automatically if there is no TCP activity for the given time.</li> </ul>	Required
Local TCP port (e.g., 4001 y		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)

Veb Interface for t	he NPort 5100 and IA	and a set of the set o			
Main Menu	Operating Settings				
Basic Settings		Port=01			
Network Settings	Operation mode	Ethernet Moder			
🖳 Serial Settings	TCP alive check time	7 (0 - 99 min)			
Operating Settings     Port 1	Local TCP Port	4001			
Accessible IP Settings	Submit				
H Annitor					

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

- 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	ATA	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	AIN	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	ATO	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	
12	AIV	1=connect (default)	
		2=ring	
		3=No carrier	
		4=error	
14	ATZ	Reset (disconnect, enter command mode and restore	
14	ATZ	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**

MOXA	www.mo	200, and IA5000 Series Only
Main Menu	Operating Settings	
Basic Settings		Port=01
Network Settings	Operation mode	Reverse Telnet 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 🕑
Accessible IP Settings	Apply the above settings	to all serial ports
Auto Warning Settings     Monitor		Submit

	I NPort 5000 Series

• Operation N	<b>lodes</b>			
Port 1				
Operation mode	Reverse Telne	et 💠		
TCP alive check time	7 (0 - 99 min	0		
Inactivity time	0 (0 - 655	535 ms)		
Local TCP port	4001			
Map <cr-lf></cr-lf>	CR-LF \$			
Apply the above settings to	✓ P1 All ports	□ 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**

					W Total Solution for Industrial Device Networking
Main Menu	Operation Modes				
Network Configuration	Port 1				
Serial Port Configuration	Application	Dial in/out •			
Port 1     Operation Modes	Mode	PPPD ·			
Communication Parameters	Destination IP address				
Data Buffering/Log	Source IP address				
Modem Settings	IP netmask				
Cipher Settings	TCP/IP compression	© Enable @ Disable			
Port 2	Inactivity time	0 (0 - 65535 ms)			
🖲 🖴 Port 3	Link quality report	© Enable			
🕮 🛄 Port 4	Username				
🖨 User Table	Password				
🖼 Welcome Message	Authentication type	None •			
System Configuration Administration	Try next type on authentication denied	Enable  Disable			
Log, Monitoring and Warning	Disconnect by	None •			
Common Settings	Apply the above settings to		💷 P2	© P3	🗆 P4
Change Password	appril the upore seconds to	All ports			
Save Configuration					
🗀 Restart	Submit				
Logout	South				

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**

Submit

b interface for t	he NPort 5100	, 5200, a	nd IA5000	Series Only	
MOXA	www.r	noxa.c	om		
	Operating Settings	84 84			
Overview     Basic Settings			Pr	ort=01	
	Operation mode	Di	sabled	~	
	Apply the above set	tings to all seria	I ports		
Operating Settings           Operating Settings           Port 1				Submit	
Port 2			Ľ	Submit	
b Interface for t	he Overall NPo	ort 5000 S	Series		
:• Operation	Modes				
-Operation	Modes				
	Modes Disable	\$			
Port 1	Disable	<ul><li>♦</li><li>□ P2</li></ul>	_ P3	_ P4	

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 De	evice Search U	tility					G	D 🌣
Search Devic	ce 🗸					<ul> <li>⊘ </li> </ul>	P ~	
Please click se	arch device butt	ton					긆	:
Seq.		Model	Lan1 IPv4	Lan1 MAC	Firmware Version			
No Devices								
				Items	per page: 10 👻 0 of 0	<	$\langle \rangle$	>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				(i	) 🌣	8
Search Device V	ı	▶. ~ (?	>~	₽ ~		

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 D	)evice 🗸				2 (
lease sele	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 🚺	Ô	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  $\bigcirc$  and click the unlock button  $\bigcirc$ . 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	
	۵ ۵
	ord

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.

ems per page:	10	*	1 - 2 of 2	<	<	>	>

#### 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 SEQUE	NTIALLY
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	a	
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 54501 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 .

sign	IP			
	IPv4	IPv6		
de				
atic 2 Dev	vice(s)			ASSIGN IP SEQUENTIALLY
lo.	Model Name & Mac	IP Address	Prefix	Default Gateway - opt.
È.	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	I
				CANCEL ASSIGN & RESTA

#### 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:

tode	
No.         Model Name & Mac         IP Address         Prefix         Default Gateway - opt.           1         NPort 6150         fe80:'290'e8ff'fe61:5012         64	
1 NPort 6150 fe80::290:e8ff:fe61:5012 64	P SEQUENTIALLY
2 NPort 6250 fe80::290:e8ff:fe61:5013 64 Clone "Prefix" to all o	l devices

#### 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**

MOXA Device Search Utility			(i) 🌣
Search Device V	o D	. ~	♥ ~ IP ~ III
Please click search device button		÷	Firmware Upgrade
Seq. Model Lan1 IPv4 Lan1 MAC	Firmware \	Ś	Import Configuration
		Ż	Export Configuration
No Devices		Ģ	Import Certificate
Items per page: 10	▼ 0 c	Đ	Allowlist
		÷	Restart
		¢	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

MOXA Device Search Utility	Ū 🌣
Search Device 🗸	

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.

							<u></u>	
<u>File</u> F <u>u</u> nd	ction ⊻iew <u>H</u> elp							
<u>.</u> <u>E</u> xit					port Upgrade			
No /	Model	LAN1 MAC Address	LAN1 IP Address	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
-								
<u>E</u> xit	Quit DSU							
2	Dreadere	t search for	daviana					
<u>S</u> earch	h	t search for	devices					
Search	Search de	evice by spe	cific IP					
	IP Courses as							
 Locate	Locato th							
		e device by	beeping it					
-	8							
	Access th		beeping it ough consoles	5				
_  	e Access th	e device thr		5				
	Access th			5				
Consol	Access th P Assign IP	e device thr	ough consoles					
Consol Consol Assign Un-Loo	Access th P Assign IP N Unlock th	e device thr						
<u>C</u> onsol <u>C</u> onsol <u>A</u> ssign <u>U</u> n-Loo	Access th P Assign IP N Unlock th	to a device thr to a device to device bef	ough consoles	else				
	Access the Access the Access the Access the Assign IP Assign IP Content of the Access th	to a device thr to a device to device bef	ough consoles	else				
	Access the Access the Access the Access the Assign IP Assign IP Content of the Access th	to a device thr to a device de device bef onfiguration	ough consoles	else e				
<u>C</u> onsol <u>C</u> onsol <u>A</u> ssign <u>U</u> n-Loo	Access the Access the Access the Access the Assign IP Assign IP Character Content of Access the Acc	to a device thr to a device de device bef onfiguration	ough consoles fore anything file to a device file from a dev	else e				

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								-		$\times$
<u>File</u> F <u>u</u> r	nction <u>V</u> iew <u>H</u> elp									
<u>.</u> Exit		a ≚ ! rch IP Locate ⊆o	nsole Assign IP	Un-Lock Import	Export	🛃 Upgrade				
No /	Model	LAN1 MAC Address	LAN1 IP Address	Input Password	to un-lock N	Port. ddress	Status	Firmware Version		
<b>a</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254					Ver3.14 Build 21032	913	1
		Password				×				
		Unlock								
		User	Name							
		Pass	word							
			[	🗸 ок	XG	ancel				
			L							
	ult - 1 device(s)				1					

#### Ν

#### 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.

I	 	

## **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.

Ele         Function         Yiew         Help           Image: Search         Search         Search         Image: Search         Image
Exit         Search         Search         P         Locate         Console         Assign IP         Line Indic         Import         Egpoint         Upgrade           No         Model         LAN1 MAC Address         LAN1 IP Addr         Acsign IP         C(Trl+1)         Ac Address         LAN2 IP Address         Status         Firmware Version           1         NPort 5610-8-DT         00:90:E8:84:17:5C         192:168:127:242          Ver2:5
1 NPort 5610-8-DT 00:90 E8:84:17:5C 192.168.127.242 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.

ło	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>F</u> ile F <u>u</u>	nction ⊻iew <u>H</u> elp							
<u>Ē</u> xit	🔮 🔮		nsole Assign IP Un-	Lock Import Egg				
No	Model	LAN1 MAC Address	LAN1 IP Addre	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
<b>6</b> 1	NPort 5610-8-DT	00:90:E8:84:17:5C	192.168.127.101				Ver2.5	
<b>2</b>	NPort 5610-8-DT	00:90:E8:84:17:62	192.168.127.102				Ver2.5	

#### 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>File</u> Fu	inction ⊻iew <u>H</u> elp							
<u>E</u> xit	<u> </u>	ilP Locate Co	nsole Assign IP ∐n	Lock Import Ex	port Uggrade			
No	Model	LAN1 MAC A Locate	Server 11 IP Addre /	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
<b>^</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 Eile	nction <u>V</u> iew <u>H</u> elp						- C	з ×
	<u>search</u> Search	≝ ∎ IP Locate Cor	sole Assign IP Un-L		ort Upgrade			
No /	Model	LAN1 MAC Address	Web Console (IPv4)	LAN2 MAC Address	LAN2 IP Address	Status	Firmware Version	
🔒 1	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	≦ Search Searc			n Port Sport Upgrade			
٩o	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)     Ctrl+L       Console (IPv4)     Ctrl+C       Console (IPv4)     Ctrl+C       Console (IPv4)     Ctrl+C       Console (IPv6)     Console (IPv6)       Console (IPv6)     Console (IPv6)			Ver2.5 Ver2.5	
			Assign IP Ctrl+I     Un-Lock     Import     Export     Upgrade     Accessible IP				

Aco	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>F</u> ile F <u>u</u> nd	ction <u>V</u> iew <u>H</u> elp							
<u>.</u> <u>E</u> xit	<ul> <li>Standard Me Simple Mod</li> </ul>	P 2						
	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	
<mark>-</mark> 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								<u></u>	×
<u>File</u> Function	⊻iew <u>H</u> elp								
<u> </u>	<u> </u>	Locate	 Un-Lock.	Lmport	Export	2 Upgrade			
Model	Count								
NPort 5610-8-DT NPort 5430 V3	2 1								

# **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 Set	ings Search Items			
	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.

😵 NPort Administrator-Co	onfiguration						-	×
Eile Eunction Configuration	*							
Function				onfiguration	- 0 NPort(s	)		
NPort	No. 7	Model	MAC Address	IP Address	IP Address2	Server Name	Status	
← ① Configuration ← 図 Monitor								
- Port Monitor					4			
Function <sup>pg</sup>				Link of	<			
groups↩				LISTO	f• <u>NPort</u> •↩			
	-							
	<							;
lessage Log - 0 Monitor Lo								-
No Time		Description						
			Acti	ب vity•Log				
ow: 3/27/2019 10:53:22 AN	1							 

# 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		Configure \	Veb	onfiguration	- 0 NPort(s	)		
NPort     Onfiguration     Monitor	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status	1
Port Monitor     GOM Mapping     Seport				dcast Search ify by IP Address				
			호 Loca 걸 Unio 답 Cont 를 Web	te ck īgure				
			🚖 Expo	ade Firmware rt Configuration				
	<		Impo	ort Configuration				
Message Log · 0   Monitor Log	g-0]		Assig	in IP Address				
No Time		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			Co	nfiguration -	1 NPort(s	)		
NPort     Orniguration     Monitor     Growtham     Port Monitor     Growtham     Port Monitor     Growtham     IP Address Report	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: 8 3/21/2019 4: 9 3/21/2019 4:	1:23 PM 4:28 PM 4:33 PM 7:07 PM	Found NPort(s): 1	5650-8-0 T J (00:90:E8:00 22504 (00:90:E8:63:50:FC				_	

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	n IP Locate	Configure Wel		onfiguration -	1 NPort(s	)		
□-  NPort	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status	_
Configuration     Monitor     Other Port Monitor     COM Mapping     Other Port Monitor     Other Port Monitor	<	Spect     Spect     Sec     Spect     Sec     Spect     Spec	ck ïgure	192 168 127 254		NP5250A_7162	Unlock	
essage Log - 5   Monitor Loj				_	_	_	_	
No Time		Description						
1 3/27/2019 10: 2 3/27/2019 10: 3 3/27/2019 11: 4 3/27/2019 11: 5 3/27/2019 11:	57:43 AM 02:07 AM 02:07 AM	Unlock Fail: NPort S	Fail: NPort 5250A (00:9 5250A (00:90:E8:63:50: 250A (00:90:E8:63:50:	FD)				

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

Please wait	
9 / 46 , 19%	

# Basic

nformation	Account Management Configuration Pre-shared Key System Log Settings Auto Warning					
Model Name NPort 5450I	Basic Network   IP Address Report   Serial   Operating Mode   Accessible IP					
MAC Address 00:90:E8:9A:E0:BF	Server Name NP54501_4850					
Serial Number	l ✓ Modify					
4850	Time Zone (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London 💌					
	Local Date 4/17/2023					
Firmware Version	Local Time 3:58:11 PM					
Ver 3.14	Time Server					
System Uptime	I Modify					
0 days, 00h:01m:00s	✓ Enable Web Console ✓ Enable HTTPS Console(TLS v1.2)					
	TLS v1.0/v1.1 for HTTPS console  Fable Telnet Console					
	✓ Enable Serial Console ☐ Reset Button Protect					
	Sensitive Data Encryption MD5/AES128					
	I▼ 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:SA:E0:BF Serial Number	Network Setting SNMP Setting
4850	Netmask 255.255.0 IP Configuration Static
Firmware Version Ver 3.14	Gateway
System Uptime	V Modify
0 days, 00h:01m:00s	DNS Server 1 DNS Server 2
	Modify      Fnable 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					
	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:E8:94:E0:BF Serial Number 4850 Firmware Version Ver 3.14 System Uptime 0 days, 00h:01m:00s	puration Pre-shared Key   System Log Settings   Auto Warning   dress Report   Serial   Operating Mode   Accessible IPs   ng

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.

nformation	Account Management Configuration Pre-shared Key System Log Settings Auto Warnin
Model Name NPort 5450I	Basic Network IP Address Report Serial Operating Mode Accessible IF
MAC Address 00:90:E8:9A:E0:BF	Auto Report To
Serial Number 4850	Auto Report To UDP Port 4002
Firmware Version Ver 3.14	Auto Report Period 10 (0-99 sec)
System Uptime 0 days, 00h:01m:00s	

- 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.

nformation Model Name NPort 5450l	Accour Basic	nt Manage Net		guration Pre-shared Key   S dress Report Serial	System Log Settings Operating Mode	Auto Warnin Accessible IP
MAC Address 00:90:E8:94:E0:BF	Г	<b>V</b> M				_
00:30:E0:34:E0.BF		Port	Alias	Settings		
Serial Number 4850		1 2 3 4		115200,N,8,1,RTS/C 115200,N,8,1,RTS/C 115200,N,8,1,RTS/C 115200,N,8,1,RTS/C 115200,N,8,1,RTS/C	CTS CTS	
Firmware Version Ver 3.14						
System Uptime 0 days, 00h:01m:00s						
				View S	iettings Setting	]8

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 po	rts.	
Port Alias			
Baud Rate	115200	<ul> <li>Flow Control</li> </ul>	RTS/CTS
Parity	None	<ul> <li>FIFO</li> </ul>	Enable
Data Bits	8	- Interface	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.	
Flow control	w control None, RTS/CTS, DTR/DSR, Xon/Xoff		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.

Port	Alias	OP Mode		
1 2		Real COM Mode Real COM Mode		
				_
				_
	1	1	1 Real COM Mode	1 Real 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**.

Operating Mode	Real COM Mo	ide	<b>T</b>		
Real COM					
Max. Connection	1	-			
Misc (Optional)	1.				
TCP Alive Check	Timeout				
7	(0-99 min)				
Allow Driver C	ontrol				
☐ Ignore Jamme					
	B				
Data Packing (Optio	· · · · · · · · · · · · · · · · · · ·	F	<b>.</b> .	_	-
Delimiter 1		, nexj	e Tx Timeout	0	(0-65535 ms)
Delimiter 2	00 (0-ff	Hex) Pac	king Length	0	(0-1024 bytes
Delimiter Process	Do Nothing	~			

### 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:

formation	Account Manager	ment Configuration	Pre-shared Key Sy	stem Log Settings	Auto Warning
Model Name NPort 5450I	Basic Netw	vork   IP Address F	leport Serial	Operating Mode	Accessible IPs
MAC Address 00:90:E8:9A:E0:BF Serial Number			allowed for the IPs NOT Restrictions Tallowed for the IPs NO		
4850	No	IP Address	Netmask		~
Firmware Version Ver 3.14 System Uptime 0 days, 00h:20m:53s	<ul> <li>✓ 1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> <li>6</li> <li>7</li> <li>8</li> </ul>	192.168.1.0	255.255.255.0		
	9			Setting	Ì

#### • 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 5450I MAC Address 00:90:E8:9A:E0:BF	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         Image: Notification Message       User Account       Password and Login Policy       Image: Configuration Policy         Image: Notification Message       Image: Configuration Pre-shared Key       System Log Settings       Image: Configuration Policy         Image: Configuration Pre-shared Key       Image: Configuration Pre-shared Key       Image: Configuration Policy       Image: Configuration Policy
4850	Login Message
Firmware Version Ver 3.14 System Uptime 0 days, 00h:20m:53s	Login         Authentication           Failure Message         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
	Usemarne: Password: Login	
ΜΟΧΛ	Total Solution for Industrial Device Networking	WWW.MOXa.com
	Usemame: 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.

Information Model Name NPort 54501	Basic	Network	IP Address Re		erating Mode   Accessible IP:
	Account Management		Configuration	Configuration Pre-shared Key System Log Settings Auto	
111 011 04001	Notific	ation Message	User Account	Password and Login Poli	cy ]
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			
1010.14		0			
System Uptime					
0 days, 00h:20m:53s					
		<			
					-
				[	dit Delete

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 Passv	vord ——			
Password				
Confirm Password	1			
	🗸 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	Basic Network IP Address Report Serial Operating Mode Accessible IPs					
Model Name	Account Management Configuration Pre-shared Key System Log Settings Auto Warning					
NPort 5450I	Notification Message User Account Password and Login Policy					
MAC Address						
00:90:E8:9A:E0:BF	₩ Modify					
Serial Number	Password Minimun Length [4-16]					
4850	4 (116)					
4000	Password Lifetime 0 (0-180 days, 0 for disable)					
Firmware Version	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	Enable At Least One Special Character (*!@#\$%^*!;;,<>[]{}())					
0 days, 00h:20m:53s						
	₩ Modify					
	Enable Account Login Failure Lockout					
	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/Disable	Disahle	An account login failure lockout rule can be
Account Login Failure Lockout			defined and enforced when enabled.
Detro feilune thus also ld	1-10 retry	5 if	Number of retries can be determined prior to the
Retry failure threshold		enabled	lockout
	$1.60 \min(t_0)$	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.

Configuration >	×
Information       Basic       Network       IP Address Report       Serial       Operating Mode       Accessible IPs         Model Name       NPort 54501       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:       Image: Chiper Key For Encrypting The Configuration File:       Image: Chiper Key For Encrypting The Configuration File:         Firmware Version       Firmware Version       Image: Chiper Key For Encrypting The Configuration File:       Image: Chiper Key For Encrypting The Configuration File:       Image: Chiper Key For Encrypting The Configuration File:	

# 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.



# NOTE

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

Information Model Name		etwork	IP Address	
NPort 5450	Account Mana	gement	Configurati	on Pre-shared Key System Log Settings Auto Warning
MAC Address 00:90:E8:9A:E0:BF	Modif	***	g Remote Log	g Summary
Serial Number 4850	System			System Cold Start, System Warn Start
Firmware Version Ver 3.14	Network	Ξ		DHCP/B00TP 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		Г	Login Fail, IP Changed, Passwrod Changed, Config Change, Firmware Upgrade, Firmware, Config Import, Config Export
	OpMode		Г	Connect, Disconnect
	SYSLOG	server		
	SYSLOG facility		local use 0	<u> </u>
	SYSLOG	severity	Emergency	<b>•</b>
	Click the "M	odify'' che	eck box to mo	dify configuration
ocal Log	Ke	ep the	log in th	ne flash of NPort 5000 up to 512 items.
ystem			<u> </u>	
stem Cold Start	NP	ort 50	00 cold s	start.
vstem Warm Start	NP	ort 50	00 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

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
<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

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		Iress Report   uration Pre-shared	Serial   Operating Mod Key   System Log Settin				
NPort 5450I	E-Mail and SNMP Trap Settings Event Port Event System Log Capacity						
MAC Address 00:90:E8:9A:E0:BF	Modify	Mail	Тгар				
Serial Number 4850	Cold Start	Г					
	Warm Start		Г				
Firmware Version	Authentication Failure	Γ					
Ver 3.14	IP Address Changed	Г					
System Uptime 0 days, 00h:05m:49s	Password Changed	Г					

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	Description			
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 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 54501 MAC Address 00:90:E8:3A:E0:BF Serial Number 4850 Firmware Version Ver 3.14	E-Mail and SNMP Trap Settings   Event   Port Event   System Log Capacity   E-Mail and SNMP Trap Settings   Event   Port Event   System Log Capacity   Enable System Log Capacity Warning Warning at 0 (%) Warning by   Mail   Trap System Log Oversize Action:
System Uptime 0 days, 00h:01m:00s	Dverwrite the oldest system log
	Click the "Modify" check box to modify configuration

# **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.

👖 🔮 💈 Exit Search Searc	h IP Locat	e Configure W							
Function				onfiguration	- 1 NPort(s	)			
NPort	No /	Model	MAC Address	IP Address	IP Address2	Server Name	Status		
Configuration     Monitor     Monitor     Other Monitor     Oth Monitor     Oth Monitor     Other Mapping     Off IP Address Report		NPort 5250A	2 ** ** ** ** **	Broadcast Search Specify by IP Addre Locate Unlock Configure Web Upgrade Firmware Export Configuratic Import Configuratic	on	NP5250A_7162	Unlock		
	_			Assign IP Address				_	
	) <								
Message Log - 5 Monitor Lo	g∙u∣	1							
No Time 1 3/27/201910 2 3/27/201910 3 3/27/201911 4 3/27/201911	t57:43 AM Found NPort(s): 1						_		

2. Select the correct firmware file to load.

Select File		$\times$
Select File	D:\\NP5200A, Ver1.5 Build 19013022.rom	
The Walle.	Browse	
	🗸 OK 🛛 🗶 Cance	

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		
l		
	🗸 ОК	X Cancel

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

elect File	X
Select File	
File Name:	
	Browse

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	🗙 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.

formation	Account Management Configuration Pre-shared Key System Log Settings Auto Warning
Model Name NPort 5430 V3	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	l⊽ Modify
0 days, 00h:08m:36s	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
	LCM Password Protect
	Sensitive Data Encryption MD5/AES128
	Modify Maximun 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
NPOIL 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**.

ile <u>F</u> unction Monitor <u>V</u> iew <u>H</u>	Go Stop							
Function		Add NPort				×		
NPort	/ Mode	G Select Fr	om List R	escan Sele	ct All Clear All			_
Monitor     Port Monitor     COM Mapping     PAddress Report		No ☑ 1	Model NPort 5430 V3	MAC Address 00:90:E8:9A:DF:7F	IP Address 192.168.127.254			
		<				>		
		C Input Ma	м	Address NPor	t 5110	2		

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

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

<u>File</u> Eunction Monitor <u>V</u>	iew <u>H</u> elp						
👖 🔮 🎽 Exit Add Rem		Stop					
Function			Monitor - S	Stopped - 1	NPort(s)		
NPort	No /	Model	MAC Address	IP Address	IP Address2		_
Configuration		NPort 5430 V3	00:90:E8:3A:DF:7F	192.168.127.254			

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

ile <u>F</u> unction Mo		∾ <u>H</u> elp						
🚉 🚅 Exit Add	and the Remov	re Go	Stop					
Function				Monitor - 9	Stopped - 1	NPort(s)		
NPort		No /	Model	MAC Address	IP Address	IP Address2		
Configuration								
Port Me	Add Ta	1 rget	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254			
	Add Ta Remov Load C	e Target onfigured C		00:90:E8:9A:DF:7F	192.168.127.254			
- Ronitor - Rort Me COM M - Rort Me	Add Ta	e Target onfigured C		00:90:E8:9A:DF:7F	192.168.127.254			
Port Mo	Add Ta Remov Load C	e Target onfigured C		00.90:E8:9A:DF:7F	192.168.127.254			

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 Setting	s   Advanced Settings	
De-selected Items	Selected Iter	ms
Server Name COM Number	Model     MAC Addres     IP Address     IP Address	
		<u> </u>
	<	+
	<<	
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.		
	V OK X 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.

Monit	tor 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:\W/indows\Media\Alam03.wav Browee	
	✓ OK X Cancel	

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

😻 NPort Administrator-Mo	nitor					-	$\times$
<u>File</u> Eunction Monitor ⊻ie	w <u>H</u> elp						
🚉 🔮 👗 Exit Add Remo	ve Go	Stop					
Function			Monitor -	Stopped - 1	NPort(s)		
∃- 🔊 NPort	No /	Model	MAC Address	IP Address	IP Address2		
Configuration Monitor Port Monitor CDM Mapping PAddress Report	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.

🐝 NPort Administrator-Mo	onitor					-	$\times$
	ew <u>H</u> elp						
Exit Add Remo	ive 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	ing - 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.

Wert Administrator-Mo     Eile Eunction Monitor ⊻ie								×
👖 🗳 👗 Exit Add Remo	ve Go	Stop						
Function			Monitor -	Running - 1 I	VPort(s)			
- 🔊 NPort	No /	Model	MAC Address	IP Address	IP Address2	Alive	Serve	r Name
Configuration	1	NPort 5430 V3	00:90:E8:9A: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.

Eile Eunction Port Monitor	⊻iew <u>H</u> elp						
👖 🔮 👗 Exit Add Remo	ive 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
······································	₹ 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     Advance       De-selected Items     Alive       Corn Status     >       Remote IP     >>       Serial     Lim2Ristatus       TwPR after Mon     TwPR after Mon       TwPR after Mon     V/R after Mon       TwPR after Mon     V/R after Mon       TwPR after Mon     <       TwPR after Mon     <       Load Default     <	Selected Items Model MAC Address IP Address	• •
--	--	--------

# **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 B	escan Select	All Clear All
No	Model	MAC Address	IP Address
<b>⊻</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254

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 Mappir	ng ⊻iew <u>H</u>						
👖 🗳 🎽 Exit Add Remov	e Apply	Configure					
Function			C	OM Mapping -	4 COM		
NPort	No /	Model	IP Address	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	192.168.12	Remove Target		COM2 + COM3 + COM4 + COM7 +	HiPerformance, FIF HiPerformance, FIF HiPerformance, FIF HiPerformance, FIF
				Apply Change Discard Change			
				Export 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)
Grouping sel(COM4 [assigned] Grouping sel(COM5 [in use]
COM7 (assigned) COM8 (in use)
СОМЭ
✓ OK X Cancel

#### **Advanced Settings**

COM Port Settings	>
Port Number: 4 Port(	s) Selected. 1st port is Port 1
Basic Settings Advanced	Settings Serial Parameters COM Grouping
Tx Mode	Hi-Performance
FIFO	Enable
Network Timeout	5000 (500-20000 ms)
	· · · · · · · · · · · · · · · · · · ·
	🗸 OK 🛛 🗶 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.

		Selected. 1st port is Port 1
Basic S	ettings Advanced Se	ttings Serial Parameters COM Grouping
	Baud Rate	9600
	Parity	None
	Data Bits	8 💌
	Stop Bits	1 💌
	Flow Control	None
	Apply all selected	norts

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.

File Eunction COM Mappin		Configure					
Function				СОМ	Mapping -	4 COM	
NPort     Ornfiguration     Ornfiguration     Ornfiguration     Port Monitor     Orn Monitor     Orn Mapping     Ornfiguration     IP Address Report	No	Model		IP Address /	IP Address2	Port	CO
	1 2	NPort 5430 V3 NPort 5430 V2		192.168.127.254		1	
	3	NPort 543	Add Are En. Dis CC Ap Dis Ap Dis Ap	d Target move Target able able DM Settings ply Change ceard Change poort COM Mapping poort COM Mapping		4	
	<		-	port Cow wapping	9		

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	Rescar	1	Select All	Clear All
No	Model	MAC Addres		IP A	ddress
<					
Input M	anually	IP Addr	ess	192.168.127.	254
		Model		NPort 5110	
		Ports		NPort 5210 NPort 5230 NPort 5232	
				NPort 5232I NPort 5210A NPort 5230A NPort 5250A	

2. Change the port settings as needed.



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

🚊 🗳 👗 Exit Add Remo	ive Apply	E Configure						
Function			(	СОМ	Mapping -	6 COM		
E NPort	No /	Model	IP Address		IP Address2	Port	COM Port	Mode
	1 2 3 4	NPort 5430 V3 NPort 5430 V3 NPort 5430 V3 NPort 5430 V3	5430 V3 192.168.127.254 5430 V3 192.168.127.254		54 54	1 2 3 4	COM2 COM3 COM4 COM7	Hi-Performance, Fl Hi-Performance, Fl Hi-Performance, Fl Hi-Performance, Fl
- 🥳 COM Mapping - 🔅 IP Address Report	5	NPort 5230 NPort 5230	106.100.16	💒 Ad	d Target move Target		COM9 + COM10 +	Hi-Performance, Fl Hi-Performance, Fl
					able able			
				· ·	M Settings			
				_	ply Change card Change	_		
	<	٢			oort COM Mapp	ing		

# **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			COL	4 Mapping -	6 COM				
NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mode		
Configuration     Monitor     Port Monitor     OM Mapping     PAddress Report	1 2 3 4	NPort 5430 V3         192.168.127.2           NPort 5430 V3         192.168.127.2           NPort 5430 V3         192.168.127.2           NPort 5430 V3         192.168.127.2           NPort 5430 V3         192.168.127.2			1 2 3 4	COM2 COM3 COM4 COM7	Hi-Performance, F Hi-Performance, F Hi-Performance, F Hi-Performance, F		
	5 6		dd Target move Target		1 2	COM9 + COM10 +	Hi-Performance, Fl Hi-Performance, Fl		
			able sable						
			OM Settings						
			oply Change scard Change						
lessage Log - 0   Monitor Log	<		port 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	×
Port Number: 2 Por	rt(s) Selected. 1st port is Port 5
Basic Settings Advance	d Settings   Serial Parameters   COM Grouping
COM Number	COM11 -
🔲 Auto enumer	COM9 (current) (assigned) COM10 (assigned)
Grouping sel	CDM12 CDM13 COM14 COM15
	COM16
	V OK X Cancel



# 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.

COM Por	rt Settings	×
Port N	Number: 2 Port(s) Selected. 1st port is Port 5	
Basic S	Settings Advanced Settings Serial Parameters COM Groupin	٥Ì
	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.

сом	Port Settings						×
P	ort Number: 2	2 Port(s)	Selected	l. 1st port	is Port 5		
	sic Settings Adva Serial ports:	inced S	ettings	Serial Par	ameters	СОМ (	Grouping
	IP Address 192.168.127.253 192.168.127.253		Read V	Vrite	Signal :	Status	
					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 Eunction COM Mappin	ng <u>V</u> iew <u>H</u> e	эlp						
🚉 🗳 🞽 Exit Add Remo		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
	2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance,	FIFO
- 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
- M COM Mapping	5	NPort 5230	192.168.127.253		1	COM11 (Group1	Hi-Performance,	FIFO
Muuless nepult	6	NPort 5230	192.168.127.253		2	COM10 (Group1	Hi-Performance.	FIED

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



# **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) Selecte	d. 1st port is Port	5
Basic Settings Advance	d Settings	Serial Parameter	s COM Grouping
COM Number	COM13		<b>-</b>
🔽 Auto enumer	COM16		nts.
🗖 Grouping sele	COM19		
	COM20 COM21		
	COM21		
	COM23		~
		🗸 ок	X Cancel

3. You can 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> e	lp .							
<u>i</u> 🗳 🛎		p.							
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
	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-Performance.		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
······································	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.



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.
✓ DK 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.

1 Mapping							×
; ⊻iew <u>H</u>	elp						
Apply	Configure						
		СОМ	Mapping -	6 СОМ			
No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode	
1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance,	FIFO
2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance,	FIFO
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 !
5	NPort 5230	192.168.127.253		1	COM20 (Group1)	Hi-Performance,	FIFO !
6	NPort 5230	192.168.127.253		2	COM21 (Group1)	Hi-Performance,	FIFO I
	No / 1 2 3 4 5	Apply         Configure           No         /         Model           1         NPort 5430 V3         NPort 5430 V3           2         NPort 5430 V3         NPort 5430 V3           3         NPort 5430 V3         NPort 5430 V3           5         NPort 5430 V3         NPort 5430 V3	No         /         Model         IP Address           1         NPort 5430 V3         192 168.127.254           2         NPort 5430 V3         192 168.127.254           3         NPort 5430 V3         192 168.127.254           4         NPort 5430 V3         192 168.127.254           5         NPort 5430 V3         192 168.127.254	No         /         Model         IP Address         IP Address2           1         NPort 5430 V3         192 168 127.254         192 168 127.254           2         NPort 5430 V3         192 168 127.254         192 168 127.254           3         NPort 5430 V3         192 168 127.254         192 168 127.254           5         NPort 5430 V3         192 168 127.254         192 168 127.254	Model         IP Address         IP Address         Port           1         No /         Model         IP Address         IP Address         Port           1         NPort 5430 V3         192 158 127.254         1         1           2         NPort 5430 V3         192 158 127.254         2         2           3         NPort 5430 V3         192 158 127.254         3         3           4         NPort 5430 V3         192 158 127.254         3         4           5         NPort 5230         1 21 158 127.253         1	No         /         Model         IP Address         IP Address2         Port         COM Port           1         NPort 5430 V3         192 1581 127 254         1         COM2           2         NPort 5430 V3         192 1581 27 254         2         COM43           3         NPort 5430 V3         192 1581 27 254         3         COM4 (Group1)           4         NPort 5430 V3         192 1581 27 254         4         COM7 (Group1)           5         NPort 5430 V3         192 1581 27 254         4         COM7 (Group1)           5         NPort 5230         132 1581 27 253         1         COM7 (Group1)	No         /         Model         IP Address         IP Address2         Port         COM Port         Mode           1         NPort 5430 V3         192.168.127.254         1         COM2         Hi-Performance,           2         NPort 5430 V3         192.168.127.254         2         COM3         Hi-Performance,           3         NPort 5430 V3         192.168.127.254         2         COM3         Hi-Performance,           4         NPort 5430 V3         192.168.127.254         3         CDM4 (Group1)         Hi-Performance,           5         NPort 5430 V3         192.168.127.253         1         COM7 (Group1)         Hi-Performance,           5         NPort 5230         192.168.127.253         1         COM7 (Group1)         Hi-Performance,

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-CON <u>File</u> Eunction COM Mappin		Яр						- 0	×
👖 🗳 👗 Exit Add Remove	e Apply	E Configure							
Function				СОМ	Mapping -	6 COM			
- NPort	No /	Model	IP Addr	ess	IP Address2	Port	COM Port	Mode	_
Configuration	1	NPort 5430 V3	192.168	3.127.254		1	COM2	Hi-Performance,	
Monitor	2	NPort 5430 V3		3.127.254		2	COM3	Hi-Performance,	
- Port Monitor	3	NPort 5430 V3		3.127.254		3	COM4 (Group1)	Hi-Performance,	
- 🔣 COM Mapping	4	NPort 5430 V3	THE REPORT OF THE PARTY OF	3.127.254		4	COM7 (Group1)	Hi-Performance,	
P Address Report	6	NPort 5230 NPort 5230	192.168	🖆 Add 1	ove Target		COM20 (Group1) COM21 (Group1)	Hi-Performance, I Hi-Performance, I	FIF
				Disab	-				
				COM Settings					
				Apply Disca	rd Change rd Change				
	<				t COM Mapping rt 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 COM Grouping
COM Number COM20 (current) (assigned)
Auto enumerating COM number for selected ports.
Grouping selected port(s) together.
🗸 OK 🛛 🗶 Cancel

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

ig <u>V</u> iew <u>H</u> e	lp						
e Apply	Configure						
		СОМ	Mapping -	6 СОМ			
No 🛆	Model	IP Address	IP Address2	Port	COM Port	Mode	_
1	NPort 5430 V3	192.168.127.254		1	COM2	Hi-Performance, F	IFO
2	NPort 5430 V3	192.168.127.254		2	COM3	Hi-Performance, F	IFO
3	NPort 5430 V3	192.168.127.254		3	COM4 (Group1)	Hi-Performance, F	IFO
4	NPort 5430 V3	192.168.127.254		4	COM7 (Group1)	Hi-Performance, F	IFO
5	NPort 5230	192.168.127.253		1	COM20	Hi-Performance, F	IFO I
6	NPort 5230	192.168.127.253		2	COM21 (Group1)	Hi-Performance, F	IFO
	<ul> <li>Apply</li> <li>No /</li> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>	Apply         Configure           No         /         Model           1         NPort 5430 V3         NPort 5430 V3           2         NPort 5430 V3         NPort 5430 V3           3         NPort 5430 V3         NPort 5430 V3           4         NPort 5430 V3         NPort 5430 V3           5         NPort 5430 V3         NPort 5430 V3	No         /         Model         IP Address           1         NPott 5430 V3         192 168 127 254           2         NPort 5430 V3         192 168 127 254           3         NPort 5430 V3         192 168 127 254           4         NPort 5430 V3         192 168 127 254           5         NPort 5230         192 168 127 254	No         /         Model         IP Address         IP Address2           1         NPort 5430 V3         192 168 127.254         192 168 127.254           2         NPort 5430 V3         192 168 127.254         192 168 127.254           3         NPort 5430 V3         192 168 127.254         192 168 127.254           4         NPort 5430 V3         192 168 127.254         192 168 127.254           5         NPort 5230         192 168 127.254         192 168 127.254	No         /         Model         IP Address         IP Address2         Port           1         NPort 5430 V3         192 168 127.254         1         1         NPort 5430 V3         192 168 127.254         2         3         NPort 5430 V3         192 168 127.254         2         3         NPort 5430 V3         192 168 127.254         3         4         3         3         3         192 168 127.254         3         4         3         3         3         192 168 127.254         3         3         3         192 168 127.254         3         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1         3         1	No         /         Model         IP Address         IP Address2         Port         COM Port           1         NPort 5430 V3         192 168 127.254         1         COM2           2         NPort 5430 V3         192 168 127.254         2         COM3           3         NPort 5430 V3         192 168 127.254         2         COM3           3         NPort 5430 V3         192 168 127.254         3         COM4 (Group1)           4         NPort 5430 V3         192 168 127.254         4         COM7 (Group1)           5         NPort 5300 V3         192 168 127.253         1         COM7 (Group1)	No         /         Model         IP Address         IP Address2         Pott         COM Port         Mode           1         NPort 5430 V3         192 168 127.254         1         COM 2         Hi-Performance, F           2         NPort 5430 V3         192 168 127.254         2         COM3         Hi-Performance, F           3         NPort 5430 V3         192 168 127.254         2         COM3         Hi-Performance, F           3         NPort 5430 V3         192 168 127.254         3         COM4 (Group1)         Hi-Performance, F           4         NPort 5430 V3         192 168 127.254         4         COM7 (Group1)         Hi-Performance, F           5         NPort 5230         192 168 127.253         1         COM20         Hi-Performance, F

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 Setting	gs X
Port Number:	3 Port(s) Selected. 1st port is Port 2
Basic Settings	Advanced Settings Serial Parameters COM Grouping
COMI	Number COM17 💌
E Au	to enumerating COM number for selected ports.
🔽 Gr	ouping selected port(s) together.
	🗸 OK 🕺 🗶 Cancel

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.

	liew <u>H</u> elp							
<u>i</u> <u>2</u> <u>×</u>		P						
Exit Add Remove	Apply	Configure						
Function				СОМ Марр	ing - 4	СОМ		
- No NPort	- A	Model	IP Address	IP Address2	Port	COM Port	Mode	Parameter
Configuration		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, Non
Port Monitor 3		NPort 5430 V3	192.168.127.254		3	COM17 (Gro	Hi-Performance, FIFO Ena	9600, Non
		NPort 5430 V3	192.168.127.254		4	COM17 (Gro	Hi-Performance, FIFO Ena	9600, None
COM Mapping 4								

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.

M Group
_
IS

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

👖 🔮 👗 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     Monitor     Monitor     Configuration     Monitor     Configuration     Configu	1 2	NPort 5430 \ NPort 5430 \			1 2	COM2 COM17 (Gro	Hi-Performance, FIFO Ena Hi-Performance, FIFO Ena	9600, None 9600, None
	4	×	Add Target Remove Target Enable Disable		3	COM17 (Gro COM17 (Gro		9600, None 9600, None
			COM Settings Apply Change Discard Change					
	<		Export 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           FIFO       Enable           Network Timeout       5000       (500-20000 ms)         Fast flush (only flush local buffer)       Alway Accept Open Requests         Ignore Tx Purge       Apply all selected ports	Baud Rate 9600 Parity None Data Bits 8 Stop Bits 1 Flow Control None Apply all selected ports	CDM 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	Configure						
Function				COM Mapp	oing - 4	СОМ		
NPort	No /	Model	IP Address	IP Address2	Port	COM Port	Mode	Parameter
Configuration     Monitor     Ort Monitor     Other Monitor     COM Mapping     Set IP Address Report	1 2 3	NPort 54 NPort 54	30 V3 192.168.127.254		1 2	COM2 COM17 (Gro		9600, None 9600, None
	4	NPort 54	Add Target  Remove Target  Enable Disable		4	COM17 (Gro COM17 (Gro	Hi-Performance, FIFD Ena Hi-Performance, FIFD Ena	9600, None 9600, None
			Apply Change Discard Change					
	<		Export COM Mapping Import COM Mapping					

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	I 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	~	~	<b>v</b>		
192.168.127.254		$\checkmark$	$\checkmark$	Г		
192.168.127.254	4	✓	◄	Г		
				OK		c
				OK	_ <b>X</b>	Cancel

# **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		Warnin
NPort 5430 V3	Basic Network IP Address Report Serial Operating Mode Access	sible IF
	Modify	
MAC Address 00:90:E8:9A:DF:7F	Server Name NP5430_4570	
Serial Number	T Modify	ř.
4570	Time Zone (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London 💌	
	Local Date 12/29/2022	
Firmware Version	Local Time 2:58:26 PM ÷	
Ver 3.14	Time Server	
System Uptime	Modify	
0 days, 00h:34m:06s	✓ Enable Web Console ✓ Enable HTTPS Console(TLS v1.2)	
	TLS v1.0/v1.1 for HTTPS console	
	Enable Serial Console     Reset Button Protect     LCM Password Protect	
	Sensitive Data Encryption MD5/AES128	
	Modify Maximun Login Users For Web Console 6 (1~6)	
	Auto Logout Setting 5 (1~1440min)	

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

File Function IP Address	Report ⊻iew	<u>H</u> elp						
🚊 🗗 🕽 Exit Settings G	o Stop							
Function		6	P Address Rep	ort - Stoppe	d - Port	:4002 - 0		
NPort     Configuration     Monitor     Or Monitor     Of Mon	No Z	Model	MAC Address	IP Address	Count	Previous Time	Last Tir	

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.

File Function IP Address R	eport <u>V</u> iew	<u>H</u> elp						
🙇 🗗 🕨 Exit Settings Go	Stop							
Function			P Address Rep	ort - Stoppe	d - Port	:4002 - 0		
NPort     Configuration     Monitor     Port Monitor     On Port Monitor     On Mapping     IP Address Report	No /	Model	MAC Address	IP Address	Count	Previous Time	Last Tim	e
%yt IP Address Heport								

# 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	_		$\times$					
<u>File C</u> OM Mapping Configuration <u>View</u> <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>⊻</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254	•	
<	Manually				
	COM Redundant COM	Reverse Real COM			
	COM   Redundant COM	Reverse Real COM	First Mappi	ng Port	
Real	COM Redundant COM	Reverse Real COM	First Mappi Data Port	ng Port 950	_
Real		Reverse Real COM		950	_

\*

# 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.

	t From List Mapping IPv6 COM Port		Search Sel	ect All	Clear All
No Model MAC1			Address 1	MAC 2	Address 2
<b>₽</b> 1	NPort 5430 V3	00:90:E8:9A:DF:7F	192.168.127.254		-
E					
<					
Input	Manually				
Real	COM Redundant COM	Reverse Real COM			
			First Mapping	Port	
NE	Port IP Address 192.168.1	27.253	Data Port	950	
Г	Enable Auto IP Report		Command Por	966	
			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 (	OM Mapping	Configuration	<u>V</u> iew <u>H</u> elp	p					
L. Exit	din Add F	emove App		Setting					
No	COM Port /			Address 1			Address 2		
	+COM1			192.168.127.254 9	950:966 (Po	ort1)			
	+COM5				951:967 (Por				
3	+COM6			192.168.127.254 9	952:968 (Por	ort3)			
1	+COM8			192.168.127.254 9	953:969 (Poi	ort4)			
			1						
				Information Do you want	t to activate t	the COM Po	×		
						the COM Po			
				Do you want					
				Do you want					
				Do you want					
				Do you want					
				Do you want					

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. ( <u>Tell me why this testing is important</u> .) 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.

nforma	ation		×				
0	COM Port Configuration is applied su Remember to change NPort operation		OM Mode.				
🐝 NF	Port Windows Driver Manager					-	X
<u>F</u> ile	<u>COM Mapping</u> Configuration View H	elp					
Ēxi		s Setting					
No	COM Port /	Address 1			Address 2		
1 2 3 4	COM1 COM5 COM6 COM8	192.168.127.254 192.168.127.254 192.168.127.254 192.168.127.254	950:966 ( 951:967 ( 952:968 ( 953:969 (	Port2) Port3)			
	OM Port - 4						

NO

### 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	ition ⊻ie	w <u>H</u> elp	)						
Ē. E.sit	din Add	C Remove	Apply	Undo	Setting						
No	COM Port	1			Ad COM	Setting ((	Ctrl+C)		Address 2		
1	COM1				192.168.		950:966	(Port1)		 	
2	COM5				192.168.	27.254	951:967	(Port2)			
3	COM6				192.168.	27.254	952:968	(Port3)			
4	COM8				192.168.	27.254	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.

asic Settings Adv	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			curity  │ IPv6 Settin
COM Number	COM12	er for Selected	i Ports.	
☐ Enable CO	COM12 COM13 COM14 COM15 COM16 COM16 COM17 COM18 COM19		•	Add COM
				Remove COM
<b>?</b> <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

asic Settings Adv	anced Settings   Serial Parameters	Security   IPv6 Settin
	ting COM Number for Selected Ports.	
	COM5 (current) (in use)	
COM Number	Cowo (current) (in use)	
🔽 Enable CO	M Splitting	
Index	COM Number	
		Add COM
		Remove COM

2. **Add COM** to select target COM ports for splitting; the COM port must be available.

Add Split COM	×
COM Numbe	r COM30  COM26 (in use) COM27 COM28 COM29 COM30 COM31
COM Port Setting	X
T Auto Enumerating	ced Settings   Serial Parameters   Security   IPv6 Settings   COM Number for Selected Ports: OM14 (current) (in use)
Index 1 2 3	COM Number COM14 COM27 COM28 Remove COM
? Help	▼ 0K 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	COM Mapping Configuration View	<u>H</u> elp			
Exi					
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

мохл	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
Overview Quick Setup	•	Port 1		
Basic Settings		Operation mode	RealCOM 🗸	
Network Settings - Serial Settings		TCP alive check time Max connection	7 (0 - 99 min)	
- Operating Settings Port 1		Ignore jammed IP	1 V 1 2 Io Yes	
Port 2		Allow driver control	3 4 lo Yes	
Port 3 Port 4		Data Packing	_	
Accessible IP Settings				

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
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:E8:3A:DF:7F
? Help
V DK K 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>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.

	igs Advanced Setting	s Serial Parameters	Security   IPv6 Settin
No	File Name	Issue by	Expired date
<			
1		Import	Delete
	All Selected Ports		
	nable Data Encryption Enable Certificate Aut	hentication	
ГК	eep Connection		
In Re	dundant COM mode, ti	he security function is r	not supported.
			not supported.

#### 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 <mark>)npcli /?</mark>	

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.

🐝 NPo	ort Windows	Driver Mana	ger				×
<u>F</u> ile <u>I</u>	COM Mapping	Configuratio	n ⊻iew	Help			
Exit	<b>d</b>	05		🤣 Online Help			
Exit	Add	Remove	Apply U	Port Sniffer Wizard			 
No	COM Port	1.		About	Addres	ss 2	
1 2	COM11 COM12			192.168.127.254 950:966 192.168.127.254 951:967			
otal CC	M 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 > Cance	l

#### **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.

Select COM ports to capture	Display IRP direction Log to file Hide sensitive data Refresh
Click Next, set the parameters of I Click Back, return to the task page	

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	
	ick Finish, Sniffer will start/stop ick Back, return to check the CO	to log serial data in the background. DM 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	×		
Filter to dump messa system restart. Then, you can see th monitor, like Debugy (DebugView is an ap	plication distributed by Sysinternals ®)		
Click Back, return to check the COM port settings.			
	< <u>Back</u> Finish Cancel		

> Click **Finish** and open "DebugView" to Monitor runtime serial data.

17.17775917     msportaf, 7, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_BAUD, RATE, STATUS, SUCCESS, Boak Rase: 100       17.17775917     msportaf, 8, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, CONTROL, STATUS, SUCCESS, Boak Rase: 100       17.1777587     msportaf, 8, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, CONTROL, STATUS, SUCCESS, Boak Rase: 100       17.1777587     msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, CONTROL, STATUS, SUCCESS, Boak Rase: 36000       17.1779587     msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, STATUS, SUCCESS, Boak Rase: 38000       17.1779587     msportaf, 11, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_BAUD, PARE, STATUS, SUCCESS, Bad Rase: 38000       17.179588     msportaf, 11, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, STATUS, SUCCESS, Bad Rase: 38000       17.1781863     msportaf, 12, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS, SUCCESS, Boak Rase: 38000       17.1781863     msportaf, 14, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS, SUCCESS, Boak Rase: 3800000000 FlowReplacedx00000040 XonLimit54 XoffLimit:16       17.1784864     msportaf, 14, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS, SUCCESS, HandBaketX00000001 FlowReplacedx00000040 XonLimit54 XoffLimit:16       17.1784863     msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS, SUCCESS, HandBaketX00000001 FlowReplacedx00000040 XonLimit54 XoffLimit:16       17.1784878     msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS, SUCCESS, HandBaketX0000000				_	
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0.00001000 17.1776646 mxportef, 1, MOXA UPort COM Port 1 (COM44), ICP_ML_CREATE, STATUS_SUCCESS, Bask Rate: 1200 17.1776828 17.1776828 17.1776828 17.1776828 17.177714 17.177714 17.177714 17.177714 17.177714 17.177714 17.177714 17.177714 17.177714 17.17772 17.177714 17.17772 17.1777					
17/176664       msportaf, 1, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET LAUU PARTE, STATUS, SUCCESS         17/176664       msportaf, 2, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET LAUU, PARTE, STATUS, SUCCESS, PANRE.1         17/1776814       msportaf, 3, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET LAUU, PARTE, STATUS, SUCCESS, PANRE.1         17/1777865       msportaf, 4, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET LAURE, STATUS, SUCCESS, Roth Ris Port YON YON:17 XOFF:19         17/1777865       msportaf, 6, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET LAUDE/UTS, STATUS, SUCCESS, Roth Ris Port YON YON:17 XOFF:19         17/1777865       msportaf, 6, MOXA UPort COM Port 1 (COM44), ICCL SERIAL, GET THAUPGUTS, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET THAUE/UTS, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET CHARE, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET CHARE, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET CHARS, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET CHARS, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, GET CHARS, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS, SUCCESS, Roth Risk Port OM Port 1 (COM44), ICCL SERIAL, SET LAUP PART, STATUS			Build Info: Ver1.7 Build 22101315		
17/1776288       msportaf, 2, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET_LAUE, RATE, STATUS, SUCCESS, Boad Rase: 100         17/1776184       msportaf, 3, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET_LINE, CONTROL, STATUS, SUCCESS, FLORE DERO EVA XONNE-1         17/1771184       msportaf, 4, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET_LINE, CONTROL, STATUS, SUCCESS, FLORE DERO EVA XONNE-1         17/1771185       msportaf, 4, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET_LINE, CONTROL, STATUS, SUCCESS, FLORE DERO EVA XONNE-1         17/1771352       msportaf, 7, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET_LAUDE, PATE, STATUS, SUCCESS, FLORE DERO EVA XONNE-1         17/177352       msportaf, 7, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET LAUDE, PATE, STATUS, SUCCESS, Berl Rue 1200         17/177357       msportaf, 7, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET LAUDE, PATE, STATUS, SUCCESS, Borl Rue 1200         17/177357       msportaf, 7, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, GET LAUDE, PATE, STATUS, SUCCESS, Berl Rue 1200         17/177587       msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, SET LAUDE, PATE, STATUS, SUCCESS, Berl Rue 200         17/1779587       msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, SET LAUDE, PATE, STATUS, SUCCESS, Berl Rue 200         17/179587       msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, SET, LAUDE, PATE, STATUS, SUCCESS, Berl Rue 200         17/179587       msportaf, 10, MOXA UPort COM Port 1 (COM44), ICCT_ SERIAL, SET, LINE, CONTROL, STATUS, SUCCESS, Rued Rue: 200					
<ul> <li>international status international sta</li></ul>					
<ul> <li>Introduction and the second sec</li></ul>			mxporist, 2, MOXA UPOT COM POT I (COM44), IOCIL_SERIAL_GE_EAU_RAID, STATUS SUCCESS, Baild Raid: 1200		
17.17772855       mxportef, 5, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_HANDFL/W, STATUS_SUCCESS, Rin-Handbakes/b00000001 FlowReplacedx00000000 XonLimits64 XoffLimit:16         17.17772875       mxportef, 6, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_INEGUTS, STATUS_SUCCESS, Rin-Handbakes/b00000001 FlowReplacedx00000000 XonLimits64 XoffLimit:16         17.17775977       mxportef, 7, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_INEE CONTROL, STATUS_SUCCESS, Rin-Handbakes/b00000001 FlowReplacedx00000000 XonLimits64 XoffLimit:16         17.1777587       mxportef, 7, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_INEE CONTROL, STATUS_SUCCESS, Hood Bake: 1200         17.1777587       mxportef, 8, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_CHARS, STATUS_SUCCESS, Hood Bake: 2400         17.1777587       mxportef, 10, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_GET_CHARS, STATUS_SUCCESS, Hood Bake: 3400         17.1779587       mxportef, 11, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_SET_BAUD PARTE, STATUS_SUCCESS, Hood Rake: 3400         17.1779587       mxportef, 11, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_SET_BAUD PARTE, STATUS_SUCCESS, Hood Rake: 3400         17.179688       mxportef, 12, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_SET_PARTE, STATUS_SUCCESS, Hood Rake: 3400         17.178188       mxportef, 14, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_SET_PARTE, STATUS_SUCCESS, Hood Rake: 3400000000 FlowReplacedx000000040 XonLimits64 XoffLimit:16         17.178489       mxportef, 14, MOXA UPort COM Fort 1 (COM44), ICCL_SERIAL_SET_PARTE, STATUS_SUCCESS, Hood Rakedx000000001 FlowReplacedx000000040 XonLimits64 XoffLi			mxportst, 5, MOAA OPOR COM FORT (COMM49), IOCTL_SEPIAL GET_LINE_CONTROL, STATUS_SOCCESS, r-NORD-1 mxportst, 4 MOXA (Dest COM Part (COMM49), IOCTL_SEPIAL GET_CHAPS, STATUS SICCESS, R-GOBER, EVA VON-17 VOEF-10		
<ul> <li>17/177452</li> <li>msportaf, 6, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET JTMEOUTS, STATUS, SUCCESS, Bei-Li, RAM6 RC:0 WAM6 WC:0</li> <li>17/17752</li> <li>msportaf, 7, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, GET JADU PARTE, STATUS SUCCESS, Bark Nate: 1200</li> <li>17/177752</li> <li>msportaf, 8, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, GET JADU, PARTE, STATUS SUCCESS, Bark Nate: 1200</li> <li>17/177752</li> <li>msportaf, 9, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, GET JADU, PARTE, STATUS SUCCESS, Bark Nate: 1200</li> <li>17/177952</li> <li>msportaf, 9, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, GET JANDE-LOW, STATUS SUCCESS, Bandvahaes/x00000000 VonLimit:64 XoffLimit:16</li> <li>17/179926</li> <li>msportaf, 11, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, GET JANDE-LOW, SUCCESS, Bandvahaes/x00000000 VonLimit:64 XoffLimit:16</li> <li>17/179057</li> <li>msportaf, 11, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180577</li> <li>msportaf, 11, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180577</li> <li>msportaf, 11, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180578</li> <li>msportaf, 13, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180578</li> <li>msportaf, 14, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180579</li> <li>msportaf, 15, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET LATUS, SUCCESS</li> <li>17/180571</li> <li>msportaf, 15, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET CHARS, STATUS, SUCCESS, BCOP BRC PUY 30N17 XOFF:19</li> <li>17/184678</li> <li>msportaf, 15, MOXA UPort COM Port I (COM44), IOCTL. SERIAL, SET CHARS, STATUS, SUCCESS, Ri-1 RMabake50x0000000 Poweplacex0x0000040 VonLimit:64 XoffLimit:16</li> <li>17/1846778</li> <li>msportaf, 17, MOXA UPort COM Port I (COM44), IOCTL. SE</li></ul>			myrorift, S. MOXA UPort COM Fort L (COM44) IOCTL SEPIAL GET HANDEL OW STATUS SUCCESS Handbakedv0000000 FlowBolacedv00000000 XosL init564 XoffLinit16		
17.17775917       mxporetis, 7, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LAUD_RATE, STATUS_SUCCESS, Baak Rate: 120         17.17775917       mxporetis, 8, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, CONTROL, STATUS_SUCCESS, Baak Rate: 120         17.17775987       mxporetis, 9, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, CONTROL, STATUS_SUCCESS, Baak Rate: 120         17.17775987       mxporetis, 9, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, SUCCESS, BioFD BRio EV:0 XONE1.         17.17775987       mxporetis, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_GET_LINE, SUCCESS, BioFD BRio EV:0 XONE1.         17.1779698       mxporetis, 11, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LAUD_PARTE, STATUS_SUCCESS, Baad Rate: 38400         17.1781698       mxporetis, 12, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LAUD_PARTE, STATUS_SUCCESS, Baad Rate: 38400         17.1781698       mxporetis, 12, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS_SUCCESS, Baad Rate: 38400         17.1781698       mxporetis, 14, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS_SUCCESS, Baad Rate: 38400         17.1781698       mxporetis, 14, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS_SUCCESS, Baad Rate: 38400         17.1781693       mxporetis, 14, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LINE, CONTROL, STATUS_SUCCESS, Rel-Net SCOM0000001 FlowReplace:0x00000040 XonLimit:64 XoffLimit:16         17.1784690       mxporetis, 10, MOXA UPort COM Port 1 (COM44), ICCT_SERIAL_SET_LANDELOW, STATUS_SUCCESS, Rel-Net XOM017			mxportsf. 6. MOXA UP ort COM Port 1 (COM44), IOCTL SERIAL SET TIMEOUTS, STATUS SUCCESS, RI:-1 RM:0 RC:0 WM:0 WC:0		- 1
<ul> <li>17.1779922 mxportaf, 10, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, HANDE-LOW, STA TUZ, SUCCESS, Handhalser/s00000001 FlowReplace/s00000000 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1790572 mxportaf, 11, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, ARXD, FATUS, SUCCESS, Handhalser/s0000001 FlowReplace/s00000000 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1790572 mxportaf, 12, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LRTS, STA TUZ, SUCCESS</li> <li>17.1782574 mxportaf, 13, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LRTS, STA TUZ, SUCCESS</li> <li>17.1782514 mxportaf, 14, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LINE, CONTROL, STA TUZ, SUCCESS, RANDE-1</li> <li>17.1784515 mxportaf, 15, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARS, STA TUZ, SUCCESS, ROPB Ref V9 XON17 XOFF:19</li> <li>17.17845469 mxportaf, 15, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARS, STA TUZ, SUCCESS, Hord Bark 20000001 FlowReplace/s08000040 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1784578 mxportaf, 17, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARDE-LOW, STA TUZ, SUCCESS, Handhalker/s00000001 FlowReplace/s08000040 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1784578 mxportaf, 17, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-00</li> <li>17.1784578 mxportaf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-00</li> <li>17.1784578 mxportaf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-010</li> </ul>	11	17.17775917	mxportsf, 7, MOXA UPort COM Port 1 (COM44), IOCTL SERIAL GET BAUD RATE, STATUS SUCCESS, Baud Rate: 1200		
<ul> <li>17.1779922 mxportaf, 10, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, HANDE-LOW, STA TUZ, SUCCESS, Handhalser/s00000001 FlowReplace/s00000000 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1790572 mxportaf, 11, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, ARXD, FATUS, SUCCESS, Handhalser/s0000001 FlowReplace/s00000000 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1790572 mxportaf, 12, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LRTS, STA TUZ, SUCCESS</li> <li>17.1782574 mxportaf, 13, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LRTS, STA TUZ, SUCCESS</li> <li>17.1782514 mxportaf, 14, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LINE, CONTROL, STA TUZ, SUCCESS, RANDE-1</li> <li>17.1784515 mxportaf, 15, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARS, STA TUZ, SUCCESS, ROPB Ref V9 XON17 XOFF:19</li> <li>17.17845469 mxportaf, 15, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARS, STA TUZ, SUCCESS, Hord Bark 20000001 FlowReplace/s08000040 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1784578 mxportaf, 17, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, SET, LARDE-LOW, STA TUZ, SUCCESS, Handhalker/s00000001 FlowReplace/s08000040 XonLimits<sup>64</sup> XoffLimit:16</li> <li>17.1784578 mxportaf, 17, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-00</li> <li>17.1784578 mxportaf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-00</li> <li>17.1784578 mxportaf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL, SERIAL, GET, TIMEOUTS, STATUS, SUCCESS, Ri-1 RMA PC0 WX-010</li> </ul>			mxportsf, 8, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_LINE_CONTROL, STATUS_SUCCESS, 7-NONE-1		
<ul> <li>magoriaf, 11, MOXA UPon COM Pont 1 (COM44), IOCTL, SERIAL, SET_BAUD, PATE, STATUS, SUCCESS, Bead Ruis: 38400</li> <li>17/190896 mayoriaf, 12, MOXA UPon COM Pont 1 (COM44), IOCTL, SERIAL, SET_DERTS, STATUS, SUCCESS</li> <li>17/181893 mayoriaf, 13, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, SET_DERTS, STATUS, SUCCESS</li> <li>17/182401 mayoriaf, 14, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, SET_DERTS, STATUS, SUCCESS</li> <li>17/1824134 mayoriaf, 14, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, SET_DERTS, STATUS, SUCCESS, 8-NONE-1</li> <li>17/1845134 mayoriaf, 15, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, SET_CHARS, STATUS, SUCCESS, 16-00 ERA EV3 XON(17 XOFF;19</li> <li>17/1845134 mayoriaf, 15, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, SET_CHARS, STATUS, SUCCESS, HEADENADO000001 FlowReplace0x0000040 Xoal.imit54 XoffLimit:16</li> <li>17/1845738 mayoriaf, 17, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, GET_TIMEOUTS, STATUS SUCCESS, Ri-1 RMA RC3 WMA9 WC30</li> <li>17/1846778 mayoriaf, 18, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, GET_TIMEOUTS, STATUS SUCCESS, Ri-1 RMA9 RC3 WMA9 WC30</li> <li>17/1846778 mayoriaf, 19, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, GET_TIMEOUTS, STATUS SUCCESS, Ri-1 RMA9 RC3 WMA9 WC30</li> <li>17/1846778 mayoriaf, 19, MOXA UPont COM Pont 1 (COM44), IOCTL, SERIAL, GET_TIMEOUTS, STATUS SUCCESS, Ri-1 RMA9 RC3 WMA9 WC300</li> </ul>	13		mxportsf, 9, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_CHARS, STATUS_SUCCESS, EOF:0 BR:0 EV:0 XON:17 XOFF:19		
<ul> <li>IP 1780572 msoprisf, 12, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_FRS, STATUS_SUCCESS</li> <li>IP 1781573 msoprisf, 13, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_LINE, CONTROL, STATUS_SUCCESS</li> <li>IP 17825514 msoprisf, 14, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_LINE, CONTROL, STATUS_SUCCESS, 8-NONE-1</li> <li>IP 17825514 msoprisf, 15, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_LINE, CONTROL, STATUS_SUCCESS, 8-NONE-1</li> <li>IP 17824514 msoprisf, 15, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_LINE, CONTROL, STATUS_SUCCESS, Bero Bray XON17 XOFF:19</li> <li>IP 1784576 msoprisf, 16, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET_HANDFLOW, STATUS_SUCCESS, Headbakes0x0000001 PlowReplacef0x60000040 XonLimits64 XoffLimit:16</li> <li>IP 17845778 msoprisf, 17, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, DET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RMA RC0 WMA9 WC30</li> <li>IP 17845778 msoprisf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, DET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RMA9 RC0 WMA9 WC30</li> <li>IP 17845778 msoprisf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, DET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RMA9 RC0 WMA9 WC30</li> </ul>			mxportsf, 10, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_HANDFLOW, STATUS_SUCCESS, Handshake:0x000000001 FlowReplace:0x00000000 XonLimit:56 XoffLimit:16		
17.1781383 mxcontf, 13, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_SET_DTR, STATUS_SUCCESS, Status SUCCESS, 8-NONE-1 17.17845154 mxcontf, 14, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_SET_CHARS, STATUS_SUCCESS, 8-NONE-1 17.17845154 mxcontf, 15, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_SET_CHARS, STATUS_SUCCESS, HoldBackSOM000001 FlowReplace50x0000040 XonLimit54 XoffLimit16 17.17844516 mxcontf, 16, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_SET_CHARS, STATUS_SUCCESS, HoldBackSOM000001 FlowReplace50x0000040 XonLimit54 XoffLimit16 17.1784478 mxcontf, 16, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_SET_CHARS, STATUS_SUCCESS, Rel-RMA PCO WM:9 WC:9 17.17844778 mxcontf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_OFT_TIMEOUTS. STATUS_SUCCESS, Rel-RMA PC:0 WM:9 WC:9 17.17844778 mxcontf, 19, MOXA UPont COM Pont 1 (COM44), ICCTL_SERIAL_OFT_TIMEOUTS. STATUS_SUCCESS, Rel-RMA PC:9 WM:9 WC:90					
<ul> <li>msportsf, 14, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET LINE, CONTRÓS, STATUS SUCCESS, 8: NONE-1</li> <li>17.1784519</li> <li>msportsf, 15, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET CHARS, STATUS SUCCESS, Rofo Reb Ro Vay XON17 XOFF:19</li> <li>17.1784649</li> <li>msportsf, 16, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET CHARS, STATUS SUCCESS, Headbakes0x0000001 FlowReplacef0x60000040 XonLimits64 XoffLimit:16</li> <li>17.1784678</li> <li>msportsf, 17, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET CHARGE XTATUS SUCCESS, Ri-1 RMa9 RC0 WM49 WC3</li> <li>17.17846778</li> <li>msportsf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, GET CHMGOUTS, STATUS SUCCESS, Ri-1 RMa9 RC0 WM49 WC3</li> <li>17.17846778</li> <li>msportsf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, GET CHMGOUTS, STATUS SUCCESS, Ri-1 RMa9 RC0 WM49 WC30</li> <li>17.17846778</li> <li>msportsf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, GET CHMGOUTS, STATUS SUCCESS, Ri-1 RMa9 RC0 WM49 WC30</li> </ul>					
17.17845154 mxpostaf, 15, MOXA UPort COM Port 1 (COM44), ICCTL_SERIAL_SET_CHARS, STATUS_SUCCESS, EOFO BR/0 EV/0 XONL7 XOFF:19 17.17846489 mxpostaf, 16, MOXA UPort COM Port 1 (COM44), ICCTL_SERIAL_SET_HANDFLOW, STATUS_SUCCESS, Handshake.0x0000001 FlowReplace.0x0000040 XonLimit.54 XoffLimit:16 17.17847633 mxpostaf, 17, MOXA UPort COM Port 1 (COM44), ICCTL_SERIAL_GET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RM:0 RC:0 WM:0 WC:0 17.1784778 mxpostaf, 19, MOXA UPort COM Port 1 (COM44), ICCTL_SERIAL_GET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RM:0 RC:0 WM:0 WC:0 17.1784778 mxpostaf, 19, MOXA UPort COM Port 1 (COM44), ICCTL_SERIAL_GET_TIMEOUTS, STATUS_SUCCESS, Ri-1 RM:0 RC:0 WM:0 WC:0			mxportst, 15, MOXA UPOT COM POT I (COM44), IOCTL_SERIAL_SEI_DIX, STATUS_DUCESS		
17.17846489 mxportaf, 16, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, SET HANDFLOW, STATUS, SUCCESS, Handshakes0x0000001 FlowReplaces0x80000040 XoaLimits64 XoffLimits16 17.17846778 mxportaf, 17, MOXA UPort COM Port 1 (COM44), DOIL5000, STATUS SUCCESS 17.17846778 mxportaf, 18, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, GET TIMEOUTS, STATUS SUCCESS, Ri-1 RM3 RC30 WM30 WC30 17.17846778 mxportaf, 19, MOXA UPort COM Port 1 (COM44), IOCTL. SERIAL, GET TIMEOUTS, STATUS SUCCESS, Ri-1 RM30 RC30 WM30 WC30			myports, 14, MOAR OF OIL COM POLIT (COM44), ICCTL SEPTIAL SET CHARS STATUS STATUS JOCESS COE0 RD4 VON-12 VOEE-10		
17.17847633 mxportsf, 17, MOXA UPort COM Fort I (COM44), 6601b5000, 574TUS SUCCESS 17.17848778 mxportsf, 18, MOXA UPort COM Fort I (COM44), ICCTL SERIAL GET TIMEOUTS, STATUS SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:0 17.1784972 mxportsf, 19, MOXA UPort COM Fort I (COM44), ICCTL SERIAL SET TIMEOUTS, STATUS SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:0			mycortef, 16, MOXA UPort COM Port 1 (COM44), IOCTL, SERIAL SET HANDELOW, STATUS SUCCESS, Handshake0x000000000 to Law Benace0x80000040 XonLimit64 XoffLimit16		
17.17949778 mxportef, 18, MOXA UPont COM Port I (COM44), IOCTL SERIAL GET TIMEOUTS, STATUS, SUCCESS, Ri-1 RMd RC3 WM3 WC30 17.1794992 mxportef, 19, MOXA UPont COM Port I (COM44), IOCTL SERIAL SET TIMEOUTS, STATUS SUCCESS, RI-1 RMd RC3 WM3 WC30	21		mxportsf, 17, MOXA UPort COM Port 1 (COM44), 0x001b2000, STATUS SUCCESS		
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	22				
			mxportsf, 19, MOXA UPort COM Port 1 (COM44), IOCTL SERIAL SET TIMEOUTS, STATUS SUCCESS, RI-1 RM:0 RC:0 WM:0 WC:100		
17.17851830 mxportsf, 20, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_BAUD_RATE, STATUS_SUCCESS, Baud Rate: 38400	24	17.17851830	mxportsf, 20, MOXA UPort COM Port 1 (COM44), IOCTL_SERIAL_GET_BAUD_RATE, STATUS_SUCCESS, Baud Rate: 38400		
	<	(B. (BAFORAS	A NEW AUDIN ADVIDING AND LAST APPLIA OF THE ANYTA AUGUSTA ANALYSIA		>

# **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	
include	
—— 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.

# .

Only the npreal2d requires OpenSSL library; other binaries should follow the section "Manually build the Real TTY driver with a cross-compiler".



### NOTE

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
      - - COPYING
        - hello.c
        - Makefile
- 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. 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

2. 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> </ul>	Install NPortConnect 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
	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.

			NP	ortConnec	t				
No	TTY	Name	IP Ac	ldress		Port	]	SSL	
1	tty	s002	192.168	8.127.254		950	Unenc	rypted	٥
2	tty	s003	192.168	8.127.254		951	Unenc	rypted	\$
-									
				2 items					(
+	- 10						Cano	cel	Apply
							Guin		

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	\$
2	ttys003	192.168.127.254	951	Unencrypted	\$
		2 items			
+		)		Cancel	\pply

#### Certificate pane would appear:

	Certificate		
Local Certificate		心也心	
Subject	NPortConr	nect530511967	
lssuer	NPortConr	nect530511967	
Issue Date		(null)	Certification information at driver side
Expiration Date	2044-	10-18 10:53:17	at univer side
Validation Status		<b>2</b>	
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.

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
Issuer	HTTPS Certificate for ECC
Issue Date	2024-07-31 08:50:02
Expiration Date	2026-07-31 08:50:02
Validation Status	<b>0</b>
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.

c	ertificate
Certificate	Č 🖞 Ć
vject	HTTPS Certificate for ECC
ier	HTTPS Certificate for ECC
ue Date	2024-07-31 08:50:02
iration Date	2026-07-31 08:50:02
dation Status	<b>0</b>
ce Certificates	
Name	Expiration Date
ort_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**.

0 0	Certificate
Local Certificate	<u>ر</u> به د
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
+   -	

#### **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	🖻 💣 🛛	?	ок 🗵	<
🔍 \Program Files				
🔀 Command Prompt				]
Name: NPortCab Type:				1
Name: NPortCab Type:				I

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	COM Setting COM Mapping About					
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	NPort CE Driver Manager		
COM Setting			
Model	IP Addr	Ports	Search
NPort 5110	192.168.127.254	1	Stop
			Modify IP
			Search , Completed.
Port Index —	Add	_	
	Select the		
	of NPort th	iat 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	NPort CE Driver Manager				
COM Setting					
Model	IP Addr	Ports	Search		
NPort 5110	192.168.127.254	1	Stop		
			Modify IP		
rPort Index			Search — Completed.		
Port1 (950/9	66) Add				
	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	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	COM Setting 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.

Application (Phone, Contacts, Camera)						
Java API MxNPortAPI						
	eworks ge, Location)					
Libraries Dalvik Runtime						

#### 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.

★ Favorites     Name     Date Modified     Type     Size       Image: Desktop     Image: com     11/22/2017 342 PM     File folder       Image: Downloads     Image: com     11/22/2017 342 PM     File folder       Image: Downloads     Image: com     11/22/2017 342 PM     File folder       Image: Downloads     Image: com     11/22/2017 342 PM     File folder       Image: Downloads     Image: com     11/8/2017 802 PM     HTML Document     2 KB       Image: Documents     Image: constant-values     11/8/2017 802 PM     HTML Document     4 KB       Image: Documents     Image: constant-values     11/8/2017 802 PM     HTML Document     4 KB       Image: Dictures     Image: index-office     11/8/2017 802 PM     HTML Document     4 KB       Image: Dictures     Image: index-office     11/8/2017 802 PM     HTML Document     4 KB       Image: Computer     Image: index-office     11/8/2017 802 PM     HTML Document     46 KB       Image: Doverview-tree     11/8/2017 802 PM     HTML Document     20 KB       Image: Doverview-tree     11/8/2017 802 PM     HTML Document     20 KB       Image: Doverview-tree     11/8/2017 802 PM     HTML Document     6 KB       Image: Doverview-tree     11/8/2017 802 PM     HTML Document     6 KB		Name	Date modified	Туре	Size	
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For more details about the installation, refer to the Overview section.

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	This document is the programming pulde for the MANPORTAPI. You can get information about how to code with the MANPORTAPI quickly and how to link the MANPORTAPI Library into your program. <b>Android Platform</b> Android Platform         Application         (Phone, Contacts, Gamera)         Java API         MexPortAPI         Ubraries         Dahvik         Linux Kernel

## **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
I	Ping			С
	Save/Restart			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.

-	a	r	1	t	Ϋ́
J	0	n	е		

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 only)
Pin	Signal	Ethernet M12:
1	Tx+	
2	Tx-	
3	Rx+	
6	Rx-	$\begin{bmatrix} 1 \\ 2 \end{bmatrix} RD + \begin{bmatrix} 2 \\ 0 \end{bmatrix} = \begin{bmatrix} 3 \\ 0 \end{bmatrix}$
		4 RD-
		Housing: shield
		Power M12:
		PIN Description
		3 2 1 Input V+
		2 Not assigned
		3 Input V-
		4 Not assigned
		4 1 5 Function ground
		5

### **Serial Port Pinouts**

	Pin Ass	ignment
	Pin	RS-232
	1	DCD
	2	RxD
	3	TxD
	4	DTR
	5	GND
5	6	DSR
	7	RTS
	8	CTS
	9	_





## **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 DB		9 pins	Cable Wiring	9 pins
Female DB9 to Male DB9	CBL-F9M9-150 CBL-F9M9-20	DCD RxD TxD DTR GND DSR RTS CTS	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	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 <b>←</b> 8 2 <b>←</b> 3	DCD TxD
ę		TxD	3	RxD
Female DB9 (RS-232)		DTR GND	4 <u>→ 20</u> 5 <u>7</u>	DSR GND
le   232		DSR	6 <b>≺</b> 6	DTR
Female D (RS-232)		RTS CTS	$\begin{array}{c} 7 \\ \hline \\ 8 \\ \hline \\ \hline \\ 5 \end{array}$	CTS RTS
E E		CIS	o <b></b> 5	кіз

	Moxa Serial Cable Model Name	NPort 521	0, NPort 5610/5650 (RS-232)	
		RJ45 Port	RJ45 Connector Female DB9	Male DB9
<u>u</u>		NPort		RS-232 Device
8-pin RJ45 to DB9 Female (RS-232)		8 pins		9 pins
89 F	CBL-RJ45SF9-150 CBL-RJ45F9-150	DSR RTS		DTR CTS
Ō		GND	3 5	GND
45 t		TxD RxD	5 ৰ 3	RxD TxD
1 RJ 232		DCD	6 \prec 1	DCD
8-pin RJ4 (RS-232)		CTS DTR	•	RTS DSR
		RJ45 Port		Female DB9
8-pin RJ45 to DB9 Male (RS-232)		NPort		RS-232 Device
ale (		8 pins	Cable Wiring	9 pins
₩ 68	CBL-RJ45SM9-150 CBL-RJ45M9-150	DSR RTS		DTR CTS
° DI	CDL-KJ45M9-150	GND	3 5	GND
45 t		TxD RxD		RxD TxD
LA L		DCD	6 - 1	DCD
8-pir		CTS DTR		RTS DSR
	CBL-RJ45SF25-150 CBL-RJ45F25-150	RJ45 Port	RJ45 Connector Female DB25	Male DB25
DB25 Female (RS-232)		NPort		RS-232 Device
Fem		8 pins		25 pins
B25		DSR RTS	$\begin{array}{c}1 \\ 2 \\ \hline \end{array} \begin{array}{c}20 \\ 5 \\ \end{array}$	DTR CTS
		GND	3 7	GND
45 t		TxD RxD	5 - 2	RxD TxD
n RJ		DCD	6 \prec 8	DCD
8-pin RJ45 to		CTS DTR		RTS DSR
		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		25 pins
325	CBL-RJ455M25-150 CBL-RJ45M25-150	DSR		DTR
o DE		RTS GND	3 7	CTS GND
45 t		TxD RxD		RxD TxD
ß		DCD	6 - 8	DCD
-pin		CTS DTR		RTS DSR
00	I	2	<b>20</b>	:

	Moxa Serial Cable Model Name	NPort 563	0 (RS-422/4-wire RS-485)	
Female -485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	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)		TxD+	$\begin{array}{c} 4 \\ 5 \\ \hline \\ 6 \\ \hline \end{array} \begin{array}{c} 2 \\ 3 \\ 6 \\ \hline \end{array} \begin{array}{c} 1 \end{array}$	TxD- TxD+
Male S-485)	CBL-RJ45SM9-150 CBL-RJ45M9-150	RJ45 Port NPort 5630	RJ45 Connector Male DB9	Female DB9 RS-422/ 4-wire RS-485 Device
8-pin RJ45 to DB9 Male (RS-422/4-wire RS-485)		TxD+ TxD-	$\begin{array}{c} 4 \\ 5 \\ \hline 6 \\ \hline \end{array} \begin{array}{c} 3 \\ 2 \\ 6 \\ \hline \end{array} \begin{array}{c} 3 \\ 2 \\ 1 \end{array}$	RxD- TxD- TxD+
325 Female RS-485)	CBL-RJ45SF25-150 CBL-RJ45F25-150	RJ45 Port NPort 5630	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)		RxD- RxD+	$\begin{array}{c} 3 \\ 4 \\ 5 \\ \hline \end{array} \begin{array}{c} 7 \\ 3 \\ 2 \end{array}$	TxD- TxD+
	CBL-RJ45SM25-150	RJ45 Port NPort 5630	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+ TxD- RxD- RxD+ GND	$\begin{array}{c} 4 \\ 5 \\ \hline 6 \\ \hline \end{array} \begin{array}{c} 2 \\ 3 \\ 8 \end{array}$	25 pins RxD+ RxD- TxD- TxD+ GND

	Moxa Serial Cable Model Name	NPort 563	0 (2-wire RS-485)	
B9 RS-	CBL-RJ45SF9-150 CBL-RJ45F9-150	RJ45 Port NPort 5630	RJ45 Connector Female DB9	Male DB9 2-wire RS-485 Device
8-pin RJ45 to DB9 Female (2-wire RS- 485)		8 pins Data- Data+ GND	5 - 3 6 - 1	9 pins Data- Data+ GND
Male	CBL-RJ45SM9-150 CBL-RJ45M9-150	RJ45 Port NPort 5630		Female DB9 2-wire RS-485 Device
8-pin RJ45 to DF (2-wire RS-485)		8 pins Data- Data+ GND	5  2 $6  1$	Data+
8-pin RJ45 to DB25 Female8-pin RJ45 to DB9 (2-wire RS-485) (2-wire RS-485)	CBL-RJ45SF25-150 CBL-RJ45F25-150 CBL-RJ45SM25-150 CBL-RJ45SM25-150	RJ45 Port NPort 5630	RJ45 Connector Female DB25	Male DB25 2-wire RS-485 Device
8-pin RJ45 to DF (2-wire RS-485)		8 pins Data- Data+ GND	5 <b>~</b> 2 6 <b>~</b> 8	25 pins Data- Data+ GND
8-pin RJ45 to DB25 Male (2-wire RS-485)		RJ45 Port NPort 5630	RJ45 Connector Male DB25	Female DB25 2-wire RS-485 Device
8-pin RJ45 to DE (2-wire RS-485)		8 pins Data- Data+ GND	5 <b></b>	25 pins Data- Data+ GND

	Moxa Serial Cable Model Name	NPort 565	0 (RS-422/4-wire RS-485)	
Female S-485)	CBL-RJ45SF9-150 CBL-RJ45F9-150	RJ45 Port NPort 5650	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)		TxD+ GND TxD- RxD+	Cable Wiring         2       8         3       5         4       2         5       3         6       1	GND RxD-
		RJ45 Port NPort 5650	RJ45 Connector Male DB9	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 $\longrightarrow$ 7354 $\longrightarrow$ 35 $\longrightarrow$ 261	GND RxD- TxD+
825 Female • 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	RyD+	2 5	TVD+
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-	Cable Wiring2 $\rightarrow$ 437425368	25 pins RxD+ GND RxD- TxD+ TxD-

	Moxa Serial Cable							
	Model Name	NPort 5650	0 (2-wire RS-485)					
		RJ45 Port	RJ45 Connector Female DB9	Male DB9				
0B9 e RS-		NPort 5650		2-wire RS-485 Device				
vir	CBL-RJ45SF9-150							
45 (2-1	CBL-RJ45F9-150	8 pins	Cable Wiring	9 pins				
רא ale			3 5	GND				
8-pin RJ45 to DB9 Female (2-wire RS- 485)		Data+ Data-	$5 \underbrace{\hspace{1.5cm}}_{6 \underbrace{\hspace{1.5cm}}} 3 \\ 1$	Data+ Data-				
Male		RJ45 Port	RJ45 Connector Male DB9	Female DB9				
		NPort 5650		2-wire RS-485 Device				
0 D 185	CBL-RJ45SM9-150							
45 t RS-4	CBL-RJ45M9-150	8 pins	Cable Wiring	9 pins				
[S e		GND		GILD				
8-pin RJ45 to DE (2-wire RS-485)		Data+ Data-	5  2 6  1	Data+ Data-				
nale ()		RJ45 Port	RJ45 Connector Female DB25					
Fen	CBL-RJ45SF25-150 CBL-RJ45F25-150			DB25 <b>2-wire RS-485</b>				
8-pin RJ45 to DB25 Female8-pin RJ45 to DB9 (2-wire RS-485) (2-wire RS-485)		NPort 5650		Device				
to [ 485								
45 RS-		8 pins	Cable Wiring	25 pins				
ת RJ vire		GND						
8-pin RJ45 to DE (2-wire RS-485)		Data+ Data-		Data+ Data-				
Male		RJ45 Port	RJ45 Connector Male DB25	Female DB25				
S M₂		NPort 5650		2-wire RS-485				
8-pin RJ45 to DB25 (2-wire RS-485)	CBL-RJ45SM25-150			Device				
- pin RJ45 to Df 2-wire RS-485)	CBL-RJ45M25-150	8 pins	Cable Wiring	25 pins				
RJ4 R B		GND	3 7	GND				
pin - vii		Data+	5	Data+				
- 2 - 8		Data-	8	Data-				
	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 C	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
L SS	DTR	8	4	<b>→</b>	6	20	6	DSR
RS-	NPort							Serial Device
4-wire es		RJ45	DB9(F)		DB9(M)	DB25(M)	DB25(F)	
şω	TxD+	2	2	$\longrightarrow$	3	3	2	RxD+
	GND	3	5		5	7	7	GND
122, 4-1 Cables	TxD-	4	1	$\longrightarrow$	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
2-wire Cables	Data+	5	3	$\longleftrightarrow$	2	2	3	Data+
Са Са	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

DB25 Male Connector	DB25 Female Connector
DTR (out) 20	1 RxD (in) 2 TxD (out) 3 CTS (in) 4 RTS (out) 5 DTR (out) 6 GND 7 DCD (in) 8 13 0 0 0 0 0 0 0 0 0 0 0 0 0

# **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		
NPort 5430I		
NPort 5450I		
NPort 5630		
NPort 5650		
NPort 5230A	Adjustable, ON = 1 k $\Omega$ / OFF = 150 k $\Omega$	120 Ω
NPort 5250A	default = 150 k $\Omega$	
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 $\Omega$ , 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.

#### To set the pull high/low resistors to 1 K $\Omega$ ,

make sure both of the assigned DIP switches are in the ON position.



	SW	T	2	3
	3.	Pull High	Pull Low	Terminator
	ON	1 KΩ	1 KΩ	120 Ω
Default	OFF	150 KΩ	150 KΩ	-



#### HW version v1.4.0 or later

#### 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.



### 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	-

#### 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.

#### 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
	5W	Pull High	Pull Low	Terminator
	ON	1 KW	1 KW	120 W
Default	OFF	150 KW	150 KW	-



## 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	ТСР МІВ	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	
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	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
0			Little-endian
8	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 54301 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	0x5153	0x80005250
NPort-IA5150I-S-SC	0x5154	0x80005250
NPort-IA5150-M-SC	0x5155	0x80005250
NPort-IA5150I-M-SC	0x5156	0x80005250
NPort-IA5250	0x5251	0x80005250
NPort-IA5250I	0x5250	0x80005250

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.

# 

### 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				
C.	<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>			
***	Certifications			

2. Once completes, see the FOLLOW UPDATES button changes.

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