# NPort IA5000A-I/O NPort IAW5000A-I/O User's Manual

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# NPort IA5000A-I/O NPort IAW5000A-I/O User's Manual

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# **1** Introduction

The following topics are covered in this chapter:

- Overview
- Package Checklist
- Product Features

### **Overview**

The NPort IA5000A-I/O and NPort IAW5000A-I/O Series comprise wired and wireless serial device servers with digital I/O, providing maximum flexibility to integrate serial equipment into Ethernet networks, with rich sets of digital I/O, for a variety of industrial data acquisition applications. The digital input/output (DIO) on the device can be controlled over TCP/IP using the Modbus TCP protocol and can be configured and secured from a web browser.

The device also can be installed as a COM Port (patented Real COM) on a Windows/Linux PC to be compatible with legacy applications and is also equipped with Ethernet port(s) that allows data to be seamlessly transferred between the serial line, I/O point, LAN, and WAN, allowing the LAN and WLAN interfaces to be bridged together with one IP address. All models are ruggedly constructed, DIN-rail mountable, and designed with redundant power inputs to ensure uninterrupted operation for industrial applications.

# **Package Checklist**

#### Standard

- NPort IA5000A-I/O or NPort IAW5000A-I/O wireless device server with digital I/O
- Antenna (for the NPort IAW5000A-I/O only)
- Quick installation guide (printed)
- Warranty card

#### **Optional Accessories**

- Mini DB9F-to-TB Adapter: DB9-female-to-terminal block adapter for RS-422/485 applications
- WK-51-01: Wall-mounting kit
- DR-4524: 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input
- DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input
- DR-120-24: 120W/5A DIN-rail 24 VDC power supply with 88 to 132 VAC/176 to 264 VAC input by switch

**NOTE** Please notify your sales representative if any of the above items are missing or damaged

### **Product Features**

- Serial device server with combination of 4 DIs and 2 DOs, or 8 DIs and 4 DOs
- Redundant dual DC power inputs and relay output supported
- Enhanced remote configuration with HTTPS, SSH
- MicroSD for configuration backup
- Per-port offline port buffering and serial data log
- 4kV serial surge protection
- For NPort IA5000A-I/O Series:
  - > 6 or 12 digital I/Os to collect local data for status monitoring
  - > Cascading Ethernet ports for easy wiring
- For NPort IAW5000A-I/O Series:
  - > Link any serial, Digital I/O, or Ethernet device to an IEEE 802.11a/b/g/n network
  - Secure data access with WEP, WPA, WPA2
  - Built-in WLAN site survey tool
  - > Ethernet Bridge function for flexible integration

2

# **Getting Started**

The following topics are covered in this chapter:

- Overview
- Panel Layout
- LED Indicators
- D Pull-Up/Down Resistors for RS-422/485

#### **Connecting the Hardware**

- Connecting to the Network
- > Connecting the Power
- Connecting to a Serial Device

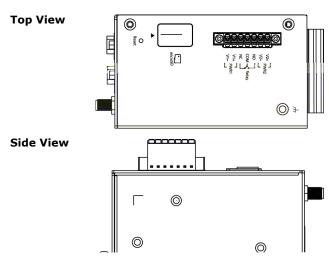
#### Pin Assignments

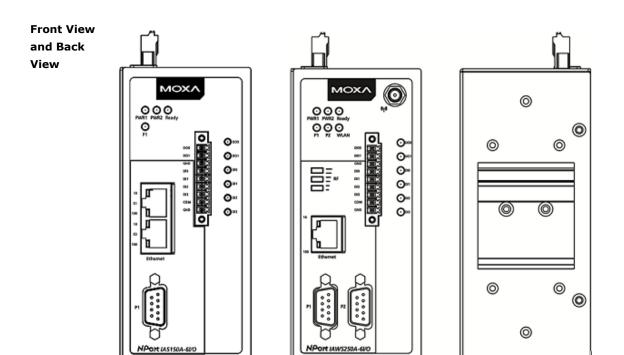
- > Serial Port Pin Assignments
- > RJ45 (Ethernet)
- > Power Inputs and Relay Output Pinouts
- > DI/DO Pinouts
- □ I/O Wiring Diagram
- Mounting the Unit
- microSD Card
  - microSD card Write Failure

# **Overview**

This chapter presents the hardware features of the IA5000A-I/O and IAW5000A-I/O and explains how to connect the hardware.

# **Panel Layout**





# **LED Indicators**

Name	Color	Function				
PWR 1, PWR 2	Green	Power is bei	ng supplied to power input PWR1, PWR2.			
Ready	Red	Steady on:	Power is on, and the NPort is booting up.			
		Blinking:	Indicates an IP conflict, or DHCP or BOOTP server did not			
			respond properly, or a relay output occurred.			
			When the above two conditions occur at the same time,			
			check the relay output first. If the Ready LED is still blinking after			
			resolving the relay output, then there is an IP conflict, or the			
			DHCP or BOOTP server did not respond properly.			
		Flashing qui	ckly: MicroSD card failed			
	Green	Steady on:	Power is on, and the NPort is functioning normally.			
		Blinking:	The device server has been located by Administrator's			
			Location function.			
	Off	Power is off,	or power error condition exists.			
WLAN	Green	Steady on:	Wireless enabled			
(for the NPort		Blinking:	NPort cannot establish WLAN connection with AP (Infrastructure)			
IAW5000A-I/O			or station (Ad-Hoc)			
only)	Off	Wireless not	Wireless not enabled.			
Signal Strength	Green	1 Bottom:	The signal strength (RSSI) is less than -74 dBm			
(3 LEDs for		2 Middle:	The signal strength (RSSI) is between -65 to -74 dBm			
the NPort		3 Top:	The signal strength (RSSI) is greater than -65 dBm			
IAW5000A-I/O						
only)						
Ethernet	Amber		ernet connection			
	Green	100 Mbps Et	hernet connection			
	Off	Ethernet cat	ole is disconnected, or has a short.			
P1, P2 (Serial)	Amber	Serial port is	s receiving data.			
	Green	Serial port is	s transmitting data			
Off No data is being transmitted or rece		No data is b	eing transmitted or received through the serial port.			
DI	Green	DI status on				
	Off	DI status of				
DO	Green	DO status or	n			
	Off	DO status of	ſf			

# Pull-Up/Down Resistors for RS-422/485

In some critical RS-422/RS-485 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-up/down resistors correctly so that the electrical signal is not corrupted. For each serial port, DIP switches are used to set the pull-up/down resistor values. A built-in 120  $\Omega$  termination resistor can also be enabled.

SW1 (Serial 1)	DIP 1	DIP 2	DIP 3
<b>SW2</b> (Serial 2)	Pull-up resistor	Pull-down resistor	Terminal resistor
ON	1 ΚΩ	1 ΚΩ	120 Ω
OFF (Default)	150 KΩ	150 KΩ	N/A



### ATTENTION

Do not use the 1 K $\Omega$  pull-up/down setting when using the RS-232 interface. Doing so will degrade the RS-232 signals and reduce the effective communication distance.

# **Connecting the Hardware**



### ATTENTION

Before connecting the hardware, follow these important wiring safety precautions:

#### **Disconnect power source**

Do not install or wire this unit or any attached devices with the power connected. Disconnect the power before installation by removing the power cord before installing and/or wiring your unit.

#### Follow maximum current ratings

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

#### Use caution - unit may get hot

The unit will generate heat during operation, and the casing may be too hot to the touch. Take care when handling the unit. Be sure to leave enough space for ventilation.

The following guidelines will help ensure trouble-free signal communication with the NPort.

- Use separate paths to route wiring for power and devices to avoid interference. Do not run signal or communication wiring and power wiring in the same wire conduit. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- Keep input wiring and output wiring separate.
- Label all wiring to each device in the system for easier testing and troubleshooting

### **Connecting to the Network**

Use the supplied Ethernet cable to connect the NPort to your Ethernet network. If the cable is properly connected, the NPort will indicate a valid connection to the Ethernet as follows:

- A green Ethernet LED indicates a valid connection to a 100 Mbps Ethernet network.
- An orange Ethernet LED indicates a valid connection to a 10 Mbps Ethernet network.
- A flashing Ethernet LED indicates that Ethernet packets are being transmitted or received.

### **Connecting the Power**

The unit can be powered by connecting a power source to the terminal block.

- 1. We recommend using 24 to 16 AWG wire. Strip 9 to 10 mm of insulation off the end of the wire before inserting it into the terminal block hole.
- 2. The power input range is from 12 to 48 VDC.

To remove the wire from the terminal block, use a flathead screwdriver to push the orange slot next to the terminal block hole, and then pull the wire out.

Note that the unit does not have an on/off switch. It automatically turns on when it receives power. The PWR LED on the front panel will glow to indicate that the unit is receiving power. There are two DC power inputs for redundancy.

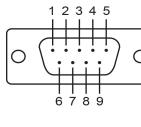
# **Connecting to a Serial Device**

Use a serial cable to connect your serial device to a serial port on the NPort.

# **Pin Assignments**

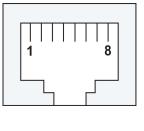
The IA5000A-I/O and IAW5000A-I/O Series use DB9 serial ports to connect to serial devices. Each port supports three serial interfaces that select by software: RS-232, RS-422, and RS-485 (both 2 and 4-wire).

### **Serial Port Pin Assignments**



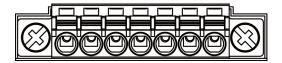
Pin	RS-232	RS-422/ RS-485 (4W)	RS-485 (2W)
1	DCD	TxD-(A)	-
2	RXD	TxD+(B)	-
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	-	-
7	RTS	-	-
8	CTS	-	-
9	_	_	_

### **RJ45 (Ethernet)**



Pin	RS-232
1	Tx+
2	Tx-
3	Rx+
4	-
5	-
6	Rx-
7	-
8	-

### **Power Inputs and Relay Output Pinouts**



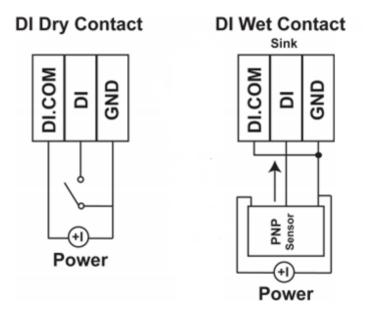
V2+	V2-	]		]	V1+	V1-
DC Power Input 2	DC Power Input 2	N.O.	Common	N.C.	DC Power Input 1	DC Power Input 1

### **DI/DO Pinouts**



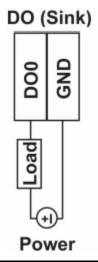
DOO	D01	GND	DI0	DI1	DI2	DI3	СОМ	GND
Digital	Digital	Ground	Digital	Digital	Digital	Digital	Common	Ground
Output 0	Output 1		Input 0	Input 1	Input 2	Input 3		

# **I/O Wiring Diagram**



A dry dontact is a contact that works without a power source.

A **wet contact** is a contact that must work with a power source.



**NOTE** A "load" in a circuit schematic is a component or portion of the circuit that consumes electrical power. For the diagrams shown in this document, "load" refers to the devices or systems connected to the I/O unit.

# **Mounting the Unit**

- 1. Connect the power adapter. Connect the 12–48 VDC power line or DIN-rail power supply to the NPort IA5000A-I/O and IAW5000A-I/O devices' terminal block.
- 2. Use a serial cable to connect the NPort to a serial device.
- 3. Use an Ethernet cable to connect the NPort to the PC for configuration setup.
- 4. The NPort IA5000A-I/O and IAW5000A-I/O are designed to be attached to a DIN rail or mounted on a wall. For DIN-rail mounting, properly insert the top of the DIN rail into the DIN rail slot until it "snaps" into place. For wall mounting, install the wall-mount kit (optional) first, and then screw the device onto the wall. The following figure illustrates the two mounting options:

### microSD Card

The IA5000A-I/O and IAW5000A-I/O Series are equipped with a microSD card slot for easy configuration. The microSD card can be used to store an NPort's system configuration settings. The behavior of MicroSD card is described as below:

- · Automatically load the configuration after system reboot
- Manually load and save the configuration through the web console

### microSD card Write Failure

The following events will cause the microSD card to experience a write failure.

- 1. The microSD card has less than 20 MB of free space.
- 2. The NPort configuration file is read-only.
- 3. The microSD card's file system is corrupted.
- 4. The microSD card is damaged.

The NPort will halt the write action if any of the above conditions exists. The NPort's Ready LED will flash and the beeper will sound to inform the user of the write failure.

# **Initial IP Configuration**

The following topics are covered in this chapter:

- □ Overview
- Factory Default IP Settings
- Using ARP to Assign IP Address
- Using the Telnet Console to Assign IP Address
- **Using the Serial Console to Assign IP Address**

# **Overview**

This chapter presents several ways to assign the NPort's IP address for the first time. Please refer to Chapter 2 for instructions on connecting to the network.

The web console is the recommended method for configuring the NPort. Please refer to Chapter 6 to 12 for details on using the web console for configuration. With the NPort's default setting (Ethernet Bridge function disabled), please ensure the Ethernet cable is connected before powering up the NPort. Then, proceed to following IP configuration options.

# **Factory Default IP Settings**

### NPort IA5000A-I/O Series

Network Interface	IP Configuration	IP Address	Netmask
LAN	Static	192.168.127.254	255.255.255.0

### NPort IAW5000A-I/O Series

Network Interface	IP Configuration	IP Address	Netmask
LAN	Static	192.168.126.254	255.255.255.0
WLAN	Static	192.168.127.254	255.255.255.0

If your NPort is configured to obtain its IP settings from a DHCP or BOOTP server, but it is unable to get a response, then it will use the factory default IP address and netmask.



### ATTENTION

If you forget the IP address of your NPort, you can look it up using the Device Search Utility (DSU). After the DSU has found all NPorts on the network, each unit will be listed with its IP address. Please refer to Chapter 5 for additional information on using the DSU.

# **Using ARP to Assign IP Address**

The ARP (Address Resolution Protocol) command can be used to assign an IP address to the NPort. The ARP command tells your computer to associate the NPort's MAC address with the specified IP address. You must then use Telnet to access the NPort, at which point the device server's IP address will be reconfigured. This method only works when the NPort is configured with default IP settings.

- 1. Select a valid IP address for your NPort. Consult with your network administrator if necessary.
- 2. Obtain the NPort's MAC address from the label on its bottom panel.
- 3. From the DOS prompt, execute the **arp** -s command with the desired IP address and the NPort's MAC address, as in the following example:

arp -s 192.168.200.100 00-90-E8-xx-xx-xx

In this example 192.168.200.100 is the new IP address that will be assigned to the NPort, and 00-90-E8-xx-xx is the NPort's MAC address.

 From the DOS prompt, execute a special Telnet command using port 6000, as in the following example: telnet 192.168.200.100 6000

In this example, 192.168.200.100 is the new IP address that will be assigned to the NPort.

5. You will see a message indicating that the connection failed.



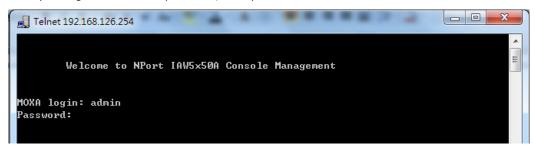
The NPort will automatically reboot with the new IP address. You can verify that the configuration was successful by connecting to the new IP address with Telnet, ping, the web console, or the DSU.

# Using the Telnet Console to Assign IP Address

- 1. Select **Run...** from the Windows Start menu.
- 2. Enter telnet 192.168.126.254 or 192.168.127.254 (the NPort's default IP address) and click [OK].

Run	<u>? ×</u>
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	telnet 192.168.126.254
	OK Cancel <u>B</u> rowse

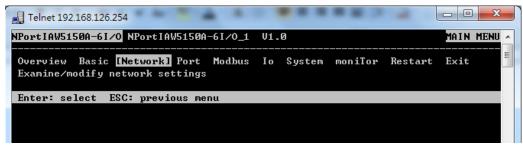
3. Enter your login account and password, then press ENTER.



4. You will login to the **Overview** page.



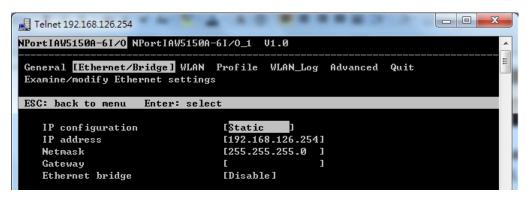
5. Press N or use the cursor keys to select Network and press ENTER.



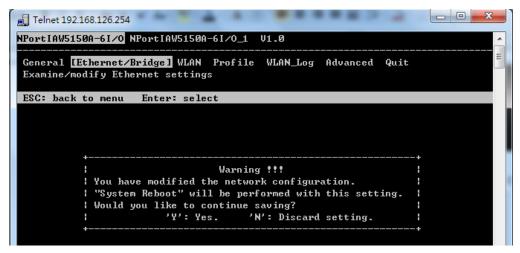
6. Press E or use the cursor keys to select Ethernet and press ENTER.



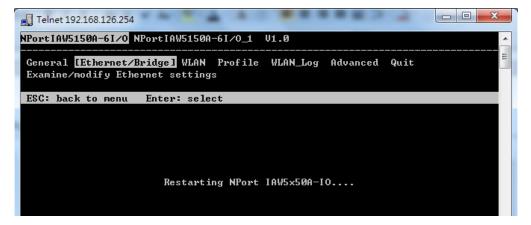
 Use the cursor keys to navigate between the different fields. For IP address, Netmask, and Gateway, enter the desired values directly. For IP configuration and LAN speed, press ENTER to open a submenu and select between the available options.



8. Press ESC to return to the menu. When prompted, press Y to save the configuration changes.



The NPort will reboot with the new IP settings. You can telnet to the new IP to log in again.



# Using the Serial Console to Assign IP Address

Before using the NPort's serial console, turn off the power and use a serial cable to connect the NPort console port to your computer's serial port. Port 1 on the NPort serves as the console port. Use Port 1 connecting to the console port with a serial-based terminal or terminal emulator program, such as Windows HyperTerminal. You may also download PComm Lite at <u>www.moxa.com</u>. The terminal type should be set as ANSI or VT100, and the serial communication parameters should be set as 19200, 8, N, 1 (19200 for baud rate, 8 for data bits, None for parity, and 1 for stop bits). As soon as the connection is open, you will be presented with a text menu displaying the IA5000A-I/O and IAW5000A-I/O Series' general settings. Please refer to Chapter 4 for a description of the available settings. The following instructions, we recommend using PComm Terminal Emulator, which can be downloaded free of charge from <u>www.moxa.com</u>, to carry out the configuration procedure.

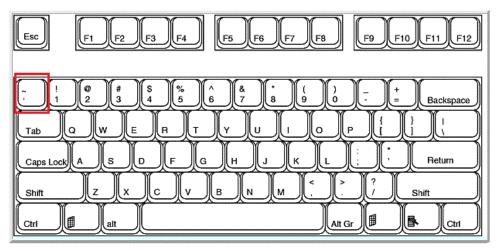
- 1. Connect your PC's serial port to the NPort's console port.
- 2. Open your terminal emulator program, such as Windows HyperTerminal. We recommend using PComm Terminal Emulator, which can be downloaded for free at <a href="http://www.moxa.com">www.moxa.com</a>.
- In your terminal emulator program, configure the communication parameters for the serial port on the PC. The parameters should be set to **19200** for baud rate, **8** for data bits, **None** for parity, and **1** for stop bits.

Property	×
Communication Parameter	er Terminal File Transfer Capturing
COM Options	
Ports :	COM1
Baud Rate :	19200 💌
Data Bits :	8
Parity :	None
Stop Bits :	1
Flow Control	Output State DTR  O ON  O OFF
XON/XOFF	RTS ON OOFF
	OK Cancel

 In your terminal emulator program, set the terminal type to ANSI or VT100. If you select Dumb Terminal as the terminal type, some of the console functions—especially the "Monitor" function—may not work properly.

Property	×
Communication Parameter	Terminal File Transfer Capturing
Terminal Type :	ANSI
Dumb Terminal Option : Transmit	
🗖 Local Echo	
Send 'Enter' Key As:	CR-LF
Receive	
CR Translation :	No Changed 💌
LF Translation :	No Changed 💌
	OK Cancel

5. Hold the **grave accent** key (`) down and power up the NPort.



The continuous string of grave accent characters triggers the NPort to switch from data mode to console mode.

6. The serial console will open and will be functionally identical to the Telnet console. Please refer to the Telnet console section for instructions on how to navigate the console and configure the IP settings.

# **Introduction to Operation Modes**

The following topics are covered in this chapter:

- Overview
- RealCOM Mode
- RFC2217 Mode
- □ TCP Server Mode
- TCP Client Mode
- UDP Mode
- IoT Mode
- Pair Connection Modes
- Ethernet Modem Mode
- Reverse Terminal Mode

### **Overview**

This chapter introduces the different serial port operation modes that are available on the NPort IA5000A-I/O and IAW5000A-I/O Series. Each serial port on the NPort is configured independently of the other ports, with its own serial communication parameters and operation mode. The serial port's operation mode determines how it interacts with the network, and different modes are available to encompass a wide variety of applications and devices.

**RealCOM** and **RFC2217** modes allow serial-based software to access the NPort serial port as if it were a local serial port on a PC. These modes are appropriate when your application relies on Windows or Linux software that was originally designed for locally attached COM or TTY devices. With these modes, you can access your devices from the network using your existing COM/TTY-based software, without investing in additional software.

Three different socket modes are available for user-developed socket programs: **TCP Server**, **TCP Client**, and **UDP Server/Client**. For TCP applications, the appropriate mode depends on whether the connection will be hosted or initiated from the NPort serial port or from the network. The main 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 multicasting of data to groups of IP addresses and would be suitable for streaming media or non-critical messaging applications such as LED message boards.

**IoT** mode is designed so that serial and I/O data can be transmitted to a cloud platform.

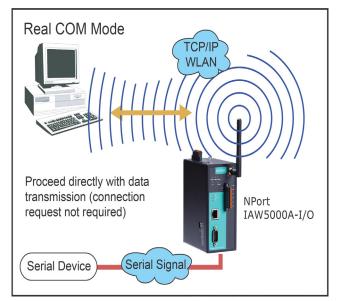
**Pair Connection Slave** and **Master** modes are designed for serial-to-serial communication over Ethernet, in order to overcome traditional limitations with serial transmission distance.

In **Ethernet Modem** mode, the NPort acts as an Ethernet modem, providing a network connection to a host through the serial port.

**Reverse Terminal** mode enables the user to connect to the serial console of a device through the Ethernet connection to the NPort (the serial console of the device is connected to the serial port of the NPort).

# **RealCOM Mode**

RealCOM mode is designed to work with NPort drivers that are installed on a network host. COM drivers are provided for Windows systems, and TTY drivers are provided for Linux and UNIX systems. The driver establishes a transparent connection to the attached serial device by mapping a local serial port to the NPort serial port. RealCOM mode supports up to four simultaneous connections, so multiple hosts can collect data from the attached device at the same time.





#### **ATTENTION**

RealCOM drivers are installed and configured through NPort Windows Driver Manager.

RealCOM mode allows you to continue using your serial communications software to access devices that are now attached to your NPort device server. On the host, the NPort RealCOM driver automatically intercepts data sent to the COM port, packs it into a TCP/IP packet, and redirects it to the network. At the other end of the connection, the NPort device server accepts the Ethernet frame, unpacks the TCP/IP packet, and sends the serial data to the appropriate device.



#### **ATTENTION**

In RealCOM mode, several hosts can have simultaneous access control over the NPort serial port. If necessary, you can limit access by using the NPort's Accessible IP settings. Please refer to Chapter 10 for additional information on Accessible IP settings.

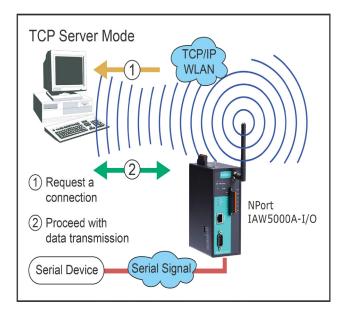
# RFC2217 Mode

RFC-2217 mode is similar to RealCOM mode, since it relies on a driver to transparently map a virtual COM port on a host computer to a serial port on the NPort. The RFC2217 standard defines general COM port control options based on the Telnet protocol and supports one connection at a time. Third party drivers supporting RFC-2217 are widely available on the Internet and can be used to implement virtual COM mapping.

# **TCP Server Mode**

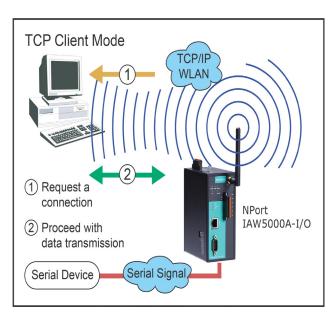
In TCP Server mode, the NPort serial port is assigned an IP:port address that is unique on your TCP/IP network. It waits for the host computer to establish a connection to the attached serial device. This operation mode also supports up to eight simultaneous connections, so multiple hosts can collect data from the attached device at the same time. Data transmission proceeds as follows: A host requests a connection to the NPort serial port.

Once the connection is established, data can be transmitted in both directions—from the host to the device, and from the device to the host.



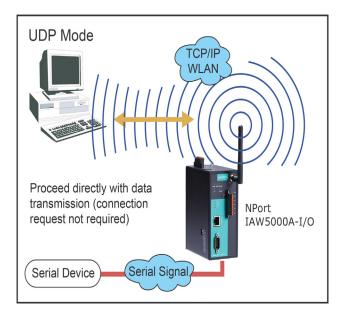
# **TCP Client Mode**

In TCP Client mode, the NPort actively establishes a TCP connection to a specific network host when data is received from the attached serial device. After the data has been transferred, the NPort can automatically disconnect from the host computer through the Inactivity time settings. Please refer to Chapter 8 for details on these parameters. Data transmission proceeds as follows: The NPort requests a connection from the host. The connection is established and data can be transmitted in both directions between the host and device.



# **UDP Mode**

UDP is similar to TCP but is faster and more efficient. Data can be broadcast to or received from multiple network hosts. However, UDP does not support verification of data and would not be suitable for applications where data integrity is critical. It is ideal for message display applications.

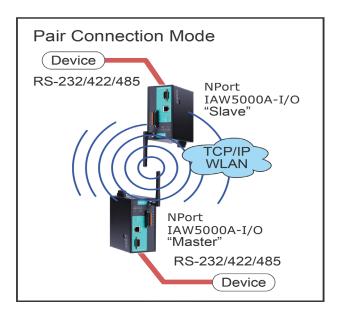


# IoT Mode

Nowadays, network owners may opt to upload serial or I/O data directly to a cloud platform for data analysis or storage. The IoT mode, using generic MQTT, can upload data to a proprietary cloud. With the built-in device SDKs can upload them to Azure or Alibaba Cloud.

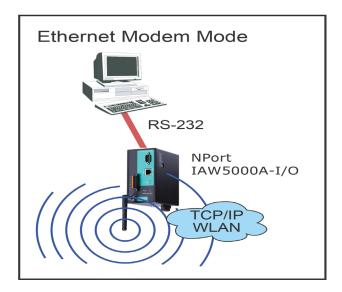
# **Pair Connection Modes**

Pair Connection Master and Slave modes connect two NPort device servers over a network for serial-to-serial communication. A device attached to one NPort can then communicate transparently to a device attached to the other NPort, as if the two devices were connected by a serial cable. Both data and modem control signals are exchanged, except for DCD signals. This can be used to overcome traditional limitations with serial communication distance and introduces many new possibilities for serialbased device control.



# **Ethernet Modem Mode**

Ethernet Modem mode is designed for use with legacy operating systems, such as MS-DOS, that do not support TCP/IP Ethernet. By connecting the properly configured NPort serial port to the MS-DOS computer's serial port, it is possible to use legacy software to transmit data over the Ethernet when the software was originally designed to transmit data over a modem.



# **Reverse Terminal Mode**

Reverse terminal applications are similar to terminal applications as they also use an NPort to manage the connection between a terminal and a server. The difference is that with reverse terminal applications, the terminal is connected through the network and the server is connected through the serial port, rather than the other way around. In practice, a reverse terminal session typically involves a network administrator telnetting to a device that has a dedicated serial console port used specifically for configuration purposes.

For example, many routers, switches, UPS units, and other devices have Console/AUX or COM ports to which a terminal can be physically connected for console management. The device's console port can be connected to a serial port on the NPort, allowing a network administrator to telnet to the device remotely through the network. Although modern network equipment generally allows other options for remote configuration through the network, there are situations in which it is necessary or desirable to configure a device by serial console (e.g., for security reasons, when using older-generation equipment, or as a backup configuration method when the network is down).

The Reverse Terminal mode is widely used for device management in control rooms. The system waits for a host on the network to initiate a connection. Since TCP Server mode does not assist with conversion of CR/LF commands, reverse terminal applications that require this conversion should use Reverse Terminal mode.

# Use Real COM Mode to Communicate with Serial Devices

The following topics are covered in this chapter:

#### Overview

#### Device Search Utility

- Installing the Device Search Utility
- > Find a Specific NPort on the Ethernet Network via the DSU
- > Opening Your Browser
- > Configure Operation Mode to Real COM Mode

#### NPort Windows Driver Manager

- > Installing the NPort Windows Driver Manager
- > Using NPort Windows Driver Manager

#### Linux Real TTY Drivers

- Basic Procedures
- Hardware Setup
- > Installing Linux Real TTY Driver Files
- > Mapping TTY Ports
- Removing Mapped TTY Ports
- Removing Linux Driver Files

#### The UNIX Fixed TTY Driver

- > Installing the UNIX Driver
- > Configuring the UNIX Driver

### **Overview**

This chapter will instruct you on how to install the necessary software and provide the steps to mapping virtual COM port to help user's software keep working as usual.

- 1. Install the Device Search Utility to find the specific NPort on the Ethernet network.
- 2. Log in to the Web console to configure the device to work on Real COM mode.
- 3. Install the NPort driver and mapping COM port.

# **Device Search Utility**

### **Installing the Device Search Utility**

- Download Device Search Utility from Moxa website, <u>https://www.moxa.com/support/download.aspx?type=support&id=10137</u>, to install the Device Search Utility. Once the program starts running, click **Yes** to proceed.
- 2. Click Settings when the Welcome screen opens, to proceed with the installation.

명 Setup - DSU	
	Welcome to the DSU Setup Wizard
	This will install DSU Ver2.0 on your computer.
	It is recommended that you close all other applications before continuing.
	Click Next to continue, or Cancel to exit Setup.
	Next > Cancel

3. Click **Next** to install program files to the default directory, or click **Browse** to select an alternate location.

🕞 Setup - DSU 🦳	- • 💌
Select Destination Location Where should DSU be installed?	
Setup will install DSU into the following folder.	
To continue, click Next. If you would like to select a different folder, click Brow	/se.
C:\Program Files (x86)\Moxa\DSU	wse
At least 2.2 MB of free disk space is required.	
< Back Next >	Cancel

4. Check the checkbox if you want the DSU to create a desktop icon, or just click **Next** to install the program's shortcuts in the appropriate Start Menu folder.

🔁 Setup - DSU	- • 💌
Select Additional Tasks Which additional tasks should be performed?	Ð
Select the additional tasks you would like Setup to perform while installing dick Next.	g DSU, then
Additional icons:	
Create a desktop icon	
< <u>B</u> ack Next >	Cancel

5. Click **Next** to proceed with the installation. The installer then displays a summary of the installation options.

🔂 Setup - DSU	• 💌
Ready to Install Setup is now ready to begin installing DSU on your computer.	
Click Install to continue with the installation, or click Back if you want to review or change any settings.	
Destination location: C:\Program Files (x86)\Moxa\DSU	*
۲	
< <u>B</u> ack Install C	ancel

- 6. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen.
- 7. Click **Finish** to complete the installation of the NPort Search Utility.

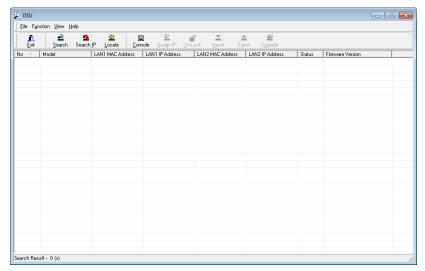
🕞 Setup - DSU	
	Completing the DSU Setup Wizard Setup has finished installing DSU on your computer. The application may be launched by selecting the installed icons. Click Finish to exit Setup.
	<u> </u>

### Find a Specific NPort on the Ethernet Network via the DSU

The Broadcast Search function is used to locate all the NPort device servers that are connected to the same LAN as your computer. After locating a NPort device server, you will be able to change its IP address.

Since the Broadcast Search function searches by MAC address and not by IP address, all NPort device servers connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

1. Open the DSU and then click the **Search** icon.



The Searching window indicates the progress of the search.

	ng for devices 0 Device(s), 8	second(s) left.		□ s	Show IPv6 Address	✓ <u>S</u> top
No	Model		LAN1 IP Address	LAN2 MAC Add	LAN2 IP Address	

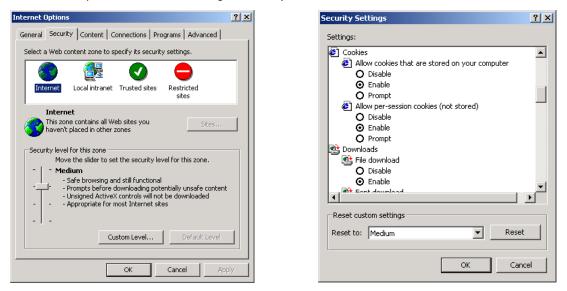
When the search is complete, all the NPort device servers that were located will be displayed in the DSU window.

o / Model LAN1 MACAddr LAN1 IP Address LAN2 MACAddr LAN2 IP Address Status Firmware Version	Ē	it Search S	Search IP Locate	sign IP Un-Lock	Import Exe	int Ur	ndrade .	
	1						Ver1.0 Build 17092716	

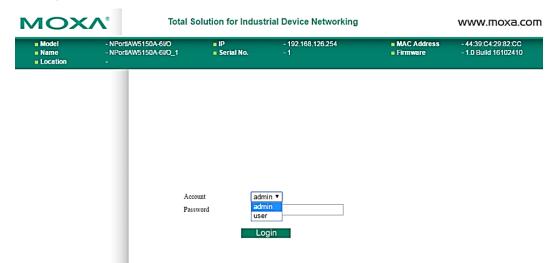
 To modify the configuration of the highlighted NPort device servers, click on the Console icon to open the web console. This will take you to the web console, where you can make all configuration changes. Please refer to Chapter 6 to 12, "Web Console: Basic Settings", for information on how to use the web console.

### **Opening Your Browser**

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



 After using the DSU to find a specific NPort, type the IP address to log in to the web console. If this is the first time you configure the NPort, you may directly type the default IP address, 192.168.127.254 in the Address input box. Use the correct IP address if it is different from the default and then press Enter. 3. On the first page of the web console, type **admin** for the default account name and **moxa** for the default password.





### ATTENTION

If you use other web browsers, remember to Enable the functions **to allow cookies that are stored on your computer** or **allow per-session cookies**. Device servers use cookies only for "password" transmission.



### ATTENTION

Refer to Chapter 3, "Initial IP Address Configuration," to see how to configure the IP address. Examples shown in this chapter use the Factory Default IP address (192.168.127.254).

The NPort IA5000A-I/O or IAW5000A-I/O homepage will open. On this page, you can see a brief description of the Web Console

мох		Total So	olution for Ind	www.moxa.com		
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortlAW5 - NPortlAW5 -		■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 00:90:E8:12:16:01 - 1.0 Build 16102410
		•We	lcome to I	NPort IAW5x50A-l	0	
- Main Menu		Model name		NPortIAW5150A-6I/O		
Overview		Serial No.		1		
Wizard		Firmware ver	sion	1.0 Build 16102410		
Basic Settings		Ethernet IP ad	idress	192.168.126.254		
- Network Settings		Ethernet MAC	address	00:90:E8:12:16:01		
- Serial Port Settings		WLAN IP add	ress	N/A		
- Modbus Address Ma	apping Table	WLAN MAC a	ddress	44:39:C4:29:82:CC		
- I/O Settings		SSID		N/A		
- System Managemen	nt	WLAN networ	k type	N/A		
- System Monitoring - Restart		WLAN securi		N/A		
- Residit				N/A		
goahead		WLAN RF typ				
Best viewed with IE 5 above at resolution 1024 x 768		WLAN countr		US		
		WLAN fast roaming		N/A		
		Active netwo	rk port	Ethernet		
		Up time		0 days 00h:07m:48s		
		Serial port 1		Real COM, 115200, None, 8, 1, RTS/	CTS	



#### ATTENTION

If you forgot the password, the ONLY way to start configuring the NPort is to load the factory defaults by using the reset button.



#### ATTENTION

Remember to export the configuration file when you have finished the configuration. After using the reset button to load the factory defaults, your configuration can be easily reloaded into the NPort by using the Import function. Refer to Chapter 10 "Web Console: System Management", for more details about using the Export and Import functions.



#### ATTENTION

If your NPort application requires using password protection, you must enable the cookie function in your browser. If the cookie function is disabled, you will not be allowed to enter the Web Console Screen.

### **Configure Operation Mode to Real COM Mode**

Click on **Operation Modes**, located under Serial Settings, to display the serial port settings for four serial ports. To modify the serial operation mode settings for a particular port, click on **Operation Modes** of the serial port in the window on the right-hand side.

MOXA	۳ »	otal Solution	al Solution for Industrial Device Networking				
	NPortIAW5150A-610 NPortIAW5150A-610		P Serial No.	- 192.168.126.254 - 1		<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
		:• Opera	tion Mod	es			
- Main Menu	Port Op	perating mode	Packing length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit
Overview		10011	0	00 (Disable)	00 (Disable)	Do Nothing	0
Wizard	1 Rea	al COM	Max connection:	1			
Basic Settings - Network Settings - Serial Port Settings Operation Modes Communication Parame Data Buffering/Log		Click for Port	Setting				

	/5150A-61/0 /5150A-61/0_1	<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
_	:• Ope	eration Mo	odes		
Main Menu	Port Settings				
Overview	Port		1		
Wizard	Operation mode		Real COM	<b>T</b>	
Basic Settings	TCP alive check		7 (0 - 99	min)	
- Network Settings	Max connection		1 •	,	
- Serial Port Settings	Ignore jammed		Disable 🔻		
Operation Modes					
Communication Parameters	Allow driver con		Disable 🔻		
Data Buffering/Log	Connection goe	s down	÷ .	ow 💿 always high	
- Modbus Address Mapping Table			DTR 🔵 always I	ow 💿 always high	
- I/O Settings	Data Packing				
- System Management - System Monitoring	Packet length		0 (0 - 1	024)	
- System Monitoring - Restart	Delimiter 1		00 (HEX)	) Enable	
- Nestan	Delimiter 2		00 (HEX)	Enable	
	Delimiter proces	\$\$	Do Nothing	(Processed only when Pac	king length is 0)
Best viewed with IE 5 above at resolution 1024 x 768	Force transmit		0 (0 - 6	5535 ms)	

# **NPort Windows Driver Manager**

### **Installing the NPort Windows Driver Manager**

The NPort Windows Driver Manager is intended for use with NPort device server 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 device server. When the drivers are installed and configured, devices that are attached to serial ports on the NPort device server will be treated as if they were attached to your PC's own COM ports.

- Download NPort Windows Driver Manager from Moxa's website, <u>https://www.moxa.com/support/download.aspx?type=support&id=974</u>, to install the NPort Windows Driver. Once the installation program starts running, click **Yes** to proceed.
- 2. Click Next when the Welcome screen opens, to proceed with the installation.



Click **Next** to install program files to the default directory, or click **Browse** to select an alternate location.

j 🖁 Setup - NPort Windows Driver Manager
Select Destination Location Where should NPort Windows Driver Manager be installed?
Setup will install NPort Windows Driver Manager into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\NPortDrvManager Browse
At least 1.4 MB of free disk space is required.
< Back Next > Cancel

3. Click **Next** to install the program's shortcuts in the appropriate Start Menu folder.

Setup - NPort Windows Driver Manager
Select Start Menu Folder Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
NPort Windows Driver Manager Browse
< Back Next > Cancel

4. Click **Next** to proceed with the installation. The installer then displays a summary of the installation options.

1/1 -	
🐻 Setup - NPort Windows Driver Manager	_ 🗆 🗙
Ready to Install Setup is now ready to begin installing NPort Windows Driver Manager on your computer.	
Click Install to continue with the installation, or click Back if you want to review change any settings.	or
Destination location: C:\Program Files\NPortDrvManager	A
Start Menu folder: NPort Windows Driver Manager	
	T
ब	
< Back Install	Cancel

5. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen. The installer will display a message that the software has not passed Windows Logo testing. This is shown as follows:

😽 Setup	- NPort Windows Driver Manager	_ 🗆 🗙
<b>Insta</b> Ple	Software Installation	
	The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. ( <u>Tell me why</u> this testing is important.)	
•	Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.	
	Continue Anyway STOP Installation	
		Cancel

Click **Continue Anyway** to finish the installation.

6. Click **Finish** to complete the installation of the NPort Windows Driver Manager.

j😽 Setup - NPort Windows Dr	Setup - NPort Windows Driver Manager					
	Completing the NPort Windows Driver Manager Setup Wizard					
	Setup has finished installing NPort Windows Driver Manager on your computer. The application may be launched by selecting the installed icons.					
	Click Finish to exit Setup.					
	✓ Launch NPort Windows Driver Manager					
	Finish					

# **Using NPort Windows Driver Manager**

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

- Go to Start → NPort Windows Driver Manager → NPort Windows Driver Manager to start the COM mapping utility.
- 2. Click the **Add** icon.

🐝 NPort	t Windows I	Drive	r Manager		
<u> </u>	OM Mapping	Conf	iguration ⊻iew <u>H</u> elp		
Exit	dd Add	C Remo	ve Apply Undo Setting		
No	COM Port	Δ	Address 1	Address 2	
					-
					-
					-
					_
					-
					_
					-
					_
					-
					_
					-
					-
Total COM	l Port - O				1

3. Click **Search** to search for the NPort device servers. From the list that is generated, select the server to which you will map COM ports, and then click **OK**.

No	Model	MAC 1	Address 1	MAC 2	Address 2
<b>v</b> 1	NPort S9450I-2S	00:90:E8:94:51:16	192.168.127.252	•3	5
put	Manually				
		)M   Reverse Real CO	м)		
	1			First Mapping Port	
NIC	ort IP Address			Data Port 95	0
INF		vit		Command Port 96	6
	Enable Auto IP Repo				

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.

	rapping in to com	Port	Search Select All Clear All		
No	Model	MAC 1	Address 1	MAC 2	Address 2
put I	anually				
Real	COM Redundant	COM Reverse Rea	ICOM		
Real(	COM Redundant	COM Reverse Rea	JCOM	First Mapping Port	
	COM Redundant Port IP Address 19		ICOM	First Mapping Port Data Port 95	0
	Hoddinddink				

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 have the ability to 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.

🐝 NPor	Windows I	Drive	r Manager				×
<u> </u>	OM Mapping	C <u>o</u> nl	iguration ⊻iew	v <u>H</u> elp			
Exit	din Add	Remo	ove Apply	Dindo Setting			
No	COM Port	$\Delta$	Address 1			Address 2	
1	COM2 +		192.168.127.2	950:966	(Port1)		
2 3	COM8 +		192.168.127.2				
3	COM9 +		192.168.127.2				
4	COM10 +		192.168.127.2	953:969	(Port4)		
				nation Do you wan		COM Port now?	
Total COM	I Port - O						

 A message will display during activation of each port, indicating that the software has not passed Windows Logo certification. Click **Continue Anyway** to proceed.

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

7. Ports that have been activated will appear in black.

	t <b>Windows Driv</b> DM Mapping Co	ver Manager Infiguration ⊻iew <u>H</u> e	lo		
Exit	di di	move Apply Undo	ß		
No	COM Port 🛛 🛆	Address 1		Address 2	
	COM2 COM8	192.168.127.254 192.168.127.254	950:966 (Port1)		
2	COM9	192.168.127.254	951:967 (Port2) 952:968 (Port3)		
1	COM10	192.168.127.254			
otal COM	I Port - 4				

Use terminal software to open the mapped COM port to communicate with the serial device. You may
download PComm Lite, a useful tool to check the serial communication, from Moxa's website:
<a href="http://www.moxa.com/support/download.aspx?type=support&id=167">http://www.moxa.com/support/download.aspx?type=support&id=167</a>

# **Configure the mapped COM ports with Advanced Functions**

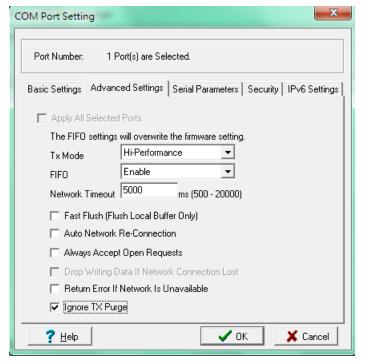
For Real COM Mode, to reconfigure the settings for a particular serial port on the NPort device server, select the row corresponding to the desired port and then click the **Setting** icon.

🐝 NPor	t Windows Drive	er Manager	
<u> </u>	OM Mapping C <u>o</u> n	figuration ⊻iew <u>H</u> elp	
Exit	din di Add Rem	sve Apply Undo Setting	
No	COM Port 🛛	Address 1	Address 2
1 2 3 4	COM2 COM8 COM9 COM10	192.168.127.254         950.966         (Port1)           192.168.127.254         951.967         (Port2)           192.168.127.254         952.968         (Port3)           192.168.127.254         953.969         (Port4)	Image: Sector
Total COM	f Port - 4	1	

 On the Basic Setting window, use the COM Number drop-down list to select a COM number to be assigned to the NPort device server's serial port that is being configured. 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.

(	COM Port Setting
	Port Number: 1 Port(s) are Selected.
	Basic Settings Advanced Settings Serial Parameters Security IPv6 Settings
	Auto Enumerating COM Number for Selected Ports.
	COM Number COM2 (current) (assigned)
	? Help Cancel

2. Click the **Advanced Settings** tab to modify Tx Mode, FIFO, and Flash Flush.



#### Tx Mode

**Hi-Performance** is the default for Tx mode. After the driver sends data to the NPort device service, the driver immediately issues a "Tx Empty" response to the program. Under **Classical** mode, the driver will not send the "Tx Empty" response until confirmation has been received from the NPort device 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 device 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 result in a faster response and lower throughput.

#### **Network Timeout**

You can use this option to prevent blocking if the target NPort is unavailable.

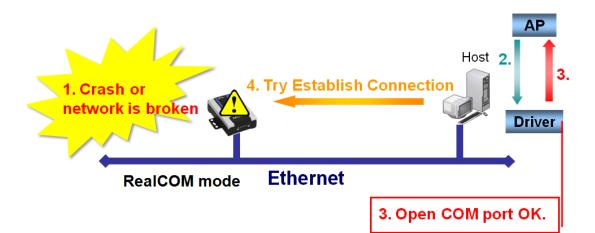
#### **Auto Network Re-Connection**

With this option enabled, the driver will repeatedly attempt to reestablish the TCP connection if the NPort device server 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.

For example, if the NPort is down or the network is broken as described in figure below. At that moment, the terminal software tries to open the mapped COM port, and the driver will respond with the message: "Success" for the terminal software to open the COM port. At the same time, the driver will try to establish the connection to the specific NPort. If the connection is established, then the mapped COM port will work properly.



#### Return error if network is unavailable

If this option is disabled, the driver will not return any error even when a connection cannot be established with the NPort device server. With this option enabled, calling the Win32 Comm function will result in the error return code "STATUS\_NETWORK\_UNREACHABLE" when a connection cannot be established to the NPort device server. This usually means that your host's network connection is down, perhaps due to a cable being disconnected. However, if you can reach other network devices, it may be that the NPort device server is not powered on or is disconnected. Note that **Auto Network Re-Connection** must be enabled in order to use this function.

#### 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 due to the additional time spent communicating across the Ethernet. This is why PurgeComm() works significantly faster with native COM ports on a PC than with mapped COM ports on the NPort device server. 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 device server 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.

#### **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.

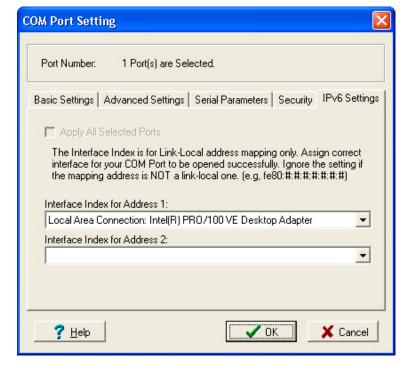
3. The **Serial Parameters** window in the following figure shows the default settings when the NPort device server is powered on. However, the program can redefine the serial parameters to different values after the program opens the port via Win 32 API.

COM Port Setting				×		
Port Number: 1 F	'ort(s) are Sel	ected.				
Basic Settings Advance	ed Settings:	Serial Parameters	Security   IPv6 Settin	gs		
Apply All Selected Ports These options will be saved on registry and used on few applications such as serial printer driver. In general cases you can ignore these settings.						
Baud Rate	9600	-				
Parity	None	•				
Data Bits	8	•				
Stop Bits	1	•				
Flow Control	None	•				
? Help			K Cancel			

4. The Enable Data Encryption function is available only for the NPort 6000 Series. When the user also enables the same function on the NPort 6000's firmware, the data transmitted on the Ethernet network will be encrypted between the NPort 6000 and the host.

COM Port Setting
Port Number: 1 Port(s) are Selected.
Basic Settings Advanced Settings Serial Parameters Security IPv6 Settings
Apply All Selected Ports
Enable Data Encryption
🗖 Keep Connection
In Redundant COM mode, the security function is not supported.
In Reverse RealCOM mode, "Keep Connection" is not supported.
<u>? H</u> elp X Cancel

5. The IPv6 Settings function is available only for the NPort 6000 Series.



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

🐝 NP	ort Windows	Driver b	fanager				
<u> </u>	<u>C</u> OM Mapping	C <u>o</u> nfigu	ration <u>V</u> iew <u>H</u> e	lp			
L Ex	🚮 Add 🚮 Remove	Ctrl+N Ctrl+D	Apply Undo	Setting			
No	🔊 Setting	Ctrl+C	dress 1	050.000	(D. 14)	Address 2	
1 2 3 4		Ctrl+S Ctrl+Z	168.127.254 168.127.254 168.127.254 168.127.254	950:966 951:967 952:968 953:969	(Port2) (Port3)		

# **Linux Real TTY Drivers**

# **Basic Procedures**

To map an NPort device server serial port to a Linux host's tty port, follow these instructions:

- Set up the NPort device server. After verifying that the IP configuration works, and you can access the NPort device server (by using ping, telnet, etc.), configure the desired serial port on the NPort device server 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 device server is **192.168.127.254**, and the default username and password are **admin** and **moxa**, respectively.

**NOTE** After installing the hardware, you must configure the operating mode of the serial port on your NPort device server to Real COM mode.

# **Installing Linux Real TTY Driver Files**

- 1. Obtain the driver file from Moxa's website, at http://www.moxa.com.
- 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 device server 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. Modifies 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 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 number of 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, map tty ports, and unload the driver. To do this, you only need to enter the directory **/usr/lib/npreal2/driver**, and 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.

# The UNIX Fixed TTY Driver

# Installing the UNIX Driver

 Log in to UNIX and create a directory for the Moxa TTY. To create a directory named /usr/etc, execute the command:

# mkdir -p /usr/etc

Copy moxattyd.tar to the directory you created. If you created the /usr/etc directory above, you
would execute the following commands:

```
# cp moxattyd.tar /usr/etc
# cd /usr/etc
```

3. Extract the source files from the tar file by executing the command:

# tar xvf moxattyd.tar The following files will be extracted: README.TXT moxattyd.c --- source code moxattyd.cf --- an empty configuration file Makefile --- makefile VERSION.TXT --- fixed tty driver version FAQ.TXT 4. Compile and Link For SCO UNIX: # make sco For UnixWare 7: # make svr5 For UnixWare 2.1.x, SVR4.2:

# make svr42

# Configuring the UNIX Driver

## Modify the configuration

The configuration used by the **moxattyd program** is defined in the text file **moxattyd.cf**, which is in the same directory that contains the program **moxattyd**. You may use **vi**, or any text editor to modify the file, as follows:

#### ttyp1 192.168.1.1 950

For more configuration information, view the file **moxattyd.cf**, which contains detailed descriptions of the various configuration parameters.

**NOTE** The "Device Name" depends on the OS. See the Device Naming Rule section in README.TXT for more information.

To start the moxattyd daemon after system bootup, add an entry into **/etc/inittab**, with the tty name you configured in **moxattyd.cf**, as in the following example:

```
ts:2:respawn:/usr/etc/moxattyd/moxattyd -t 1
```

# **Device naming rule**

For UnixWare 7, UnixWare 2.1.x, and SVR4.2, use:

**pts**/[*n*]

For all other UNIX operating systems, use:

ttyp[n]

### Starting moxattyd

Execute the command **init q** or reboot your UNIX operating system.

### Adding an additional server

- 1. Modify the text file **moxattyd.cf** to add an additional server. Users may use vi or any text editor to modify the file. For more configuration information, look at the file **moxattyd.cf**, which contains detailed descriptions of the various configuration parameters.
- 2. Find the process ID (PID) of the program **moxattyd**.
  - # ps -ef | grep moxattyd
- 3. Update configuration of **moxattyd** program.
  - # kill -USR1 [PID]

(e.g., if moxattyd PID = 404, kill -USR1 404)

This completes the process of adding an additional server.

# **Upload Serial Data to Cloud Platform**

With new firmware released, version 2.0 and later, the NPort IA5000A-I/O Series and NPort IAW5000A-I/O Series can easily upload the serial or I/O data to cloud platforms through generic MQTT or with built-in device SDKs to Azure/Alibaba Cloud.

The following topics are covered in this chapter:

Select the Cloud Platform

#### Select the IoT Operation Mode

- Define the Upload Packet Size
- > Monitor the Cloud Connection

# **Select the Cloud Platform**

Before configuring the NPort device server, please make sure you have an account for the cloud platform and the ability to add an IoT device to the cloud platform. Here we take the Microsoft Azure platform as an example. You have an account for Azure, and you have already added an IoT device on a IoT Hub there. Azure provides you a unique "Connection string (primary key)" for an IoT device to connect to Azure.

Microsoft Azure		, Search resources, services, and docs	>_ 😡 🖓	© ? ©	moxa.com
«	Home > IoT devices > E	evice details			
+ Create a resource	Device details				\$* ×
A Home	🕞 Save 🔛 Message to device 💔	Direct method 🗮 Device twin 🕂 Add module identity    Regenerate keys	U Refresh		
Dashboard      All services	Device Id 🕖	NPortIO-IoT			ľ.
+ FAVORITES	Primary key 😝	1zk6JAEFVwzeKk02F9uoKSbtuQw/91wDY+S7k8f/p5Q=			
All resources	Secondary key 🛛	tCrHZCn//9yAoBuClqgk18zglMVFjvUqXkII0vhB004=			
( Resource groups	Connection string (primary key)	HostName=' azure-devices.net;DeviceId=NPortIO-IoT;SharedAccessKey=1zk	5JAEFVwzeKk02F9uoK5btuQw/91wD	ſΥ	
Services	Connection string (secondary key)	HostName=i azure-devices.net;DeviceId=NPortIO-IoT;SharedAccessKey=tCri	HZCrx/9yAoBuCfqqk18zqIMVFjvUqXi	1	
Function Apps					
SQL databases	Connect this device to an IoT hub 0	Enable Disable			
2 Azure Cosmos DB					
Virtual machines	Parent device (preview) 🛛	No parent device			
Load balancers					
Storage accounts	Module identities Configurations				
Virtual networks	0				
Azure Active Directory	Module identities that are assoc	iated with this device.			
Monitor					
🜪 Advisor	MODULE IDENTITY NAME	CONNECTION STATE CONNECTION STATE	LAST UPDATED	LAST ACTIVITY TIME	
Security Center	No module identities listed.				
Cost Management + Bill					-
•	4				•

After you have copied the string and logged in to the NPort device server, please select the **IoT Management** → **IoT Mode** page. Drop down the **IoT mode** and select **Azure IoT Device**. Paste the string to the item Device connection string. With Azure, the NPort will send the serial and I/O data as JSON format, you may decide when to upload the I/O data; by default is when any I/O changes. Please click **Submit** to save every changes.

in Menu	Basic Settings	
Dverview	IoT platform	Azure IoT Hub
Vizard	Azure IoT Hub Settings	
Basic Settings		
- Network Settings	Device connection string	HostName=Inches and desires not Desired on Phylochysics Centres
- IoT Management	Serial and I/O Message Format Settings	
IoT Mode	Serial and I/O message definition	Serial JSON I/O JSON
IoT Connection Monitoring	I/O publish trigger mode	Any I/O change V (Only DI and DO publish their value changes)
IoT Data Buffering		(only brand bo pablish their value changes)
- Serial Port Settings		
- I/O Settings		Submit
- Remote I/O Access		
- System Management		
- System Monitoring		
- Restart		

# **Select the IoT Operation Mode**

Change the page to **Serial Port Settings**  $\rightarrow$  **Operation Mode**, then select **IoT** mode.

	<b>* Operation Mode</b>	
- Main Menu	Port Settings	
Overview	Port	1
Wizard	Operation mode	IoT v
Basic Settings	Sniffer mode	Enable (Subscribed messages will be dropped)
- Network Settings		
- IoT Management	Data Packing	
IoT Mode	Packet length	0 (0 - 2880)
IoT Connection Monitoring	Delimiter 1	00 (HEX) Enable
IoT Data Buffering	Delimiter 2	00 (HEX) Enable
- Serial Port Settings	Delimiter process	Do Nothing (Processed only when the packet length is 0)
Operation Mode	Force transmit	0 (0 - 65535 ms)
Communication Parameters	Force transmit	0 (0 - 00030 mb)
Port Buffering/Log		
- I/O Settings		Submit
- Remote I/O Access		
- System Management		
- System Monitoring		
- Restart		

# **Define the Upload Packet Size**

Since the Cloud platform may count the expenses by the size of each packet the device upload, you may modify the **Packet length** up to 2,880 bytes to save the expense. Click **Submit** to save all the modifications.

# **Monitor the Cloud Connection**

The NPort device server also provides a tool for you to monitor the cloud connection. If there is a problem, to help you to do the troubleshooting, please change to the **IoT Management**  $\rightarrow$  **IoT Connection Monitoring** page. When the **Connection status** shows Connected and the **Diagnostics log** shows Connected successfully, it means the connection is established between the NPort device server and the Cloud platform.

in Menu	Azure IoT Connection Information	
Overview	Target	tinghub acute-devices red
Vizard	Connection status	Connected
asic Settings	Diagnostics log	2019/03/28 11:23:27 Connecting
Network Settings		2019/03/28 11:23:32 Connected successfully!
oT Management		
IoT Mode		
IoT Connection Monitoring		
IoT Data Buffering		
Serial Port Settings		Reset Log
O Settings	Azure IoT Data Statistics	
temote I/O Access		
system Management	Message meter size	4.0 (0.0 - 16.0 KB)
system Monitoring	Auto clear data statistics	Disable 🔻 day of each month
Restart		

If it failed, it may provide a hint at the Diagnostics log to help with troubleshooting purposes.

7

# Web Console: Basic Settings

The following topics are covered in this chapter:

- □ Overview
- Basic Settings

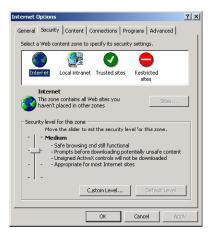
# **Overview**

This chapter introduces the NPort web console and explains how to configure the basic settings.

The NPort can be configured from anywhere on the network through its web console. Simply point the browser to the device server's IP address to open the web console. Network settings, operation mode, and other items can all be configured through the browser.

# **Web Browser Settings**

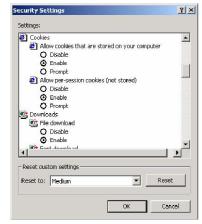
In order to use the web console, you will need to have cookies enabled for your browser. Please note that the web console uses cookies only for password transmission. For Internet Explorer, cookies can be enabled by right-clicking the Internet Explorer icon on your desktop and selecting Properties from the context menu.



On the Security tab, click "Custom Level..." and enable these two items:

Allow cookies that are stored on your computer.

Allow per-session cookies (not stored).





### ATTENTION

If you are not using Internet Explorer, cookies are usually enabled through a web browser setting such as "allow cookies that are stored on your computer" or "allow per-session cookies."

# Navigating the Web Console

To open the web console, enter your device server's IP address in the website address line. If you are configuring the NPort for the first time over an Ethernet cable, you will use the default IP address, **192.168.126.254** for the NPort IAW5000A-I/O Series, and **192.168.127.254** for the NPort IA5000A-I/O Series.

There are two account types: **admin** and **user**. If you enter the system with **admin** account, you will have the right to read and write. If you enter the system with **user** account, you will only have the right to read.

If prompted, enter the console password. You will only be prompted for a password if you have enabled password protection on the device server. The password will be transmitted with MD5 encryption over the Ethernet.

мох	Total S	Solution for Industr	ial Device Networking		www.moxa.com
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	Acc	count admi	n <b>v</b>		
	Pas	sword admi			
		Log	jin		



# ATTENTION

If you have forgotten the password, you can use the reset button to load factory defaults, but this will erase all previous configuration information.

The web console will appear as shown below.

Total S	olution for Indu	strial Device Networking		www.moxa.com		
- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 00:90:E8:12:16:01 - 1.0 Build 16102410		
• We	lcome to N	Port IAW5x50A-I	0			
Model name		NPortIAW5150A-6I/O				
Serial No.		1				
Firmware ve	rsion	1.0 Build 16102410				
Ethernet IP a	ddress	192.168.126.254				
Ethernet MA	C address	00:90:E8:12:16:01				
	Iress	N/A				
	address	44:39:C4:29:82:CC				
SSID	L	N/A				
WLAN netwo	rk type	N/A				
WLAN secur	ity mode	N/A				
WLAN RF typ	De	N/A				
WLAN count	rv code	US				
	-	N/A				
		Ethernet				
	·					
	L		CTS			
	PortiAW5150A-6I/O     NPortiAW5150A-6I/O     NPortiAW5150A-6I/O_1      Model name     Serial No.     Firmware ve     Ethernet IP a     Ethernet IP a     WLAN IP add     WLAN NAC a     SSID     WLAN netwo     WLAN REtyr     WLAN REtyr     WLAN fast ret	NPortiAW5150A-6i/O     NPortiAW5150A-6i/O     Serial No.      Serial No.      Model name     Serial No.     Firmware version     Ethernet IP address     Ethernet IP address     WLAN IP address     WLAN NAC address     SID     WLAN network type     WLAN security mode     WLAN RF type     WLAN country code     WLAN fast roaming     Active network port     Up time	NPortIAW5150A-6I/O     NPortIAW5150A-6I/O     Serial No.     1     Serial No.     1     Serial No.     1     Firmware version     1.0 Build 16102410     Ethernet IP address     192.168.126.254     Ethernet MAC address     192.168.126.254     Ethernet MAC address     N/A     WLAN IP address     N/A     WLAN MAC address     N/A     WLAN network type     N/A     WLAN fast roaming     N/A     Active network port     Ethernet     Up time     0 days 00h:07m:48s	• NPortIAW5150A-6I/O       • IP       • 192.168.126.254       • MAC Address         • NPortIAW5150A-6I/O       • 1       • Firmware         • Welcome to NPort IAW5150A-6I/O       Serial No.       1         Image: Serial No.       1       1         Firmware version       1.0 Build 16102410         Ethernet IP address       192.168.126.254         Ethernet MAC address       00:90:E8:12:16:01         WLAN IP address       N/A         WLAN MAC address       44:39:C4:29:82:CC         SSID       N/A         WLAN network type       N/A         WLAN RF type       N/A         WLAN Recurity mode       N/A         WLAN fast roaming       N/A         Q days 00h:07m:48s       Up time		

Settings are presented on pages that are organized by folder. Select the desired folder in the left navigation panel to open that page. The page will be displayed in the main window on the right. Certain folders can be expanded by clicking the adjacent "–" symbol.

For example, if you click **Basic Settings** in the navigation panel, the main window will show a page of basic settings that you can configure.

After you have made changes on a page, you must click **[Submit]** in the main window before jumping to another page. Your changes will be lost if you do not click **[Submit]**.

Once you click [Submit] button, the device server will reboot and with a beep alarm.

# **Basic Settings**

ΜΟΧΛ°	Total	Solution for Industrial Dev	vice Networking					
Model Name Location	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - MOXA00000001				MAC Addre Firmware	\$\$
	-Basic Setting	s						
Main Menu	Server Settings							
Overview	Server name		NPortIAW5150A	-6I/O_1	)	1		
Wizard	Server location					i		
Basic Settings			L					
- Network Settings	I/O Settings							
- Serial Port Settings	Enable Server socket idle of	connection time out interval	60		000 (1 RE	EDE defeu	lt = 60 diaa	blo = 0
Modbus Address Mapping Table     VO Settings			60				lt = 60, disa	
- System Management	Enable Communication was	tendog timeout	0		sec (1-65	535, defau	lt = 0, disab	ie = 0)
- System Monitoring	ñ							
- Restart	Time Settings							
	Time zone		(GMT)Greenwic	h Mean Tir	ne: Dublin,	, Edinburg	h, Lisbon, L	ondon 🔻
goahead WEBSERVER	Local time (24-hour)		2016 / 12	/ 29	07	: 24	: 35	[
est viewed with IE 5 above at	Time server							
resolution 1024 x 768								

On the **Basic Settings** page, you can configure:

### Server Name

Default	NPortIA5150A-6I/O_ <serial no.=""> or NPort IA5250A-6I/O_<serial no.=""></serial></serial>
	NPortIAW5150A-6I/O_ <serial no.=""> or NPort IAW5250A-6I/O_<serial no.=""> NPortIA5150A-</serial></serial>
	12I/O_ <serial no.=""> or NPort IA5250A-12I/O_<serial no.=""></serial></serial>
	NPortIAW5150A-12I/O_ <serial no.=""> or NPort IAW5250A-12I/O_<serial no.=""></serial></serial>
Options	free text (e.g., "Server 1")
Description	This is an optional free text field to help you differentiate one device server from another.
	It does not affect operation of the NPort device server.

# **Server Location**

Default	
Options	free text (e.g., "Bldg 1, 2nd Floor")
Description	This is an optional free text field to help you differentiate one device server from another.
	It does not affect operation of the NPort device server.

# Enable Server socket idle connection timeout interval

Default	Enabled (60 secs)			
Options	1-65535, default = 60, disable = 0			
Description The NPort will automatically disconnect the Modbus/TCP connection from the server a				
	specified time period to free up the port for the next connection if function is enabled.			

# Enable Communication watchdog timeout

Default	Disabled
Options	1-65535, default = 60, disable = 0
Description	This function will activate Safe Mode when a specified period of time has passed and
	there is a loss of Modbus/TCP network connectivity. Safe Mode is specially designed for
	products with output channels to output a suitable value or status when the NPort cannot
	be controlled by a remote PC (such as in the event of a network failure). By default, the
	watchdog is disabled. Users can configure how each output channel responds on the <b>I/O</b>
	Settings page. To enable the Communication Watchdog function, select the Enable
	<b>Communication Watchdog</b> checkbox, set the timeout value, and then restart the server.
	When the watchdog is enabled, the NPort will enter <b>Safe Mode</b> when there is a disruption
	in communication that exceeds the specified time limit. User may go to System Alert
	Status under System Monitoring tab to see the host connection status and clear the
	alert if the Modbus/TCP connection resumes.

#### Time Zone

Default	(GMT)Greenwich Mean Time
Options	(GMT)Greenwich Mean Time
	(GMT-01:00)Azores, Cape Verde Is.
	(GMT-02:00)Mid-Atlantic etc.
Description	This field shows the currently selected time zone and allows you to select a different time
	zone.

#### Local Time

Default					
Options	Date (yy:mm:dd), Time (hh:mm:ss)				
Description	The NPort has a built-in real-time clock that allows you to add time information to				
	functions such as t	the automatic warnir	ng e-mail or S	NMP trap. This field	shows the current
	time according to	the NPort's built-in r	eal-time clock	. This is not a live fi	eld, so you will
	5	e browser to get an i			, ,
		e browser to get and		ng.	
	Change the correc	t date or time, and c	lick [Submit]	. The change will ta	ke effect directly,
	and shows Basic	Setting OK!.			
		<b>,</b>			
	MOX/	Total So	olution for Indust	rial Device Networking	
	Model Name	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - 1	MAC Address Firmware
	Location				
		Basic Settings	OKI		
		Dusic settings	on.	Back	
	- Main Menu			Dack	
	Overview				
	Wizard				
	Basic Settings				
	- Network Settings				
	- Serial Port Settings - Modbus Address Mapp	ing Table			
	- Modbus Address Mapp	ing table			
	- System Management				
	- System Monitoring				
	- Restart				



# ATTENTION

There is a risk of explosion if the real-time clock battery is replaced incorrectly!

The real time clock is powered by a lithium battery. We strongly recommend that you obtain assistance from a Moxa support engineer before replacing the battery. Please contact the Moxa RMA service team if you need to change the battery.

### **Time Server**

Default	
Options	IP address or domain name (e.g., "192.168.1.1" or "time.nist.gov")
Description	This optional field specifies your time server's IP address or domain name, if a time server
	is used in your network. The NPort supports SNTP (RFC-1769) for automatic time
	calibration. The device server will request time information from the specified time server
	every 10 minutes.

# Web Console: Network Settings

The following topics are covered in this chapter:

#### □ Overview

- Network Settings
  - General Settings
  - Ethernet/Bridge Settings
  - > WLAN Settings
  - Advanced Settings

# **Overview**

This chapter explains how to configure all settings located under the **Network Settings** folder in the NPort web console.

# **Network Settings**

# **General Settings**

	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
	:• Ge	neral Settin	gs	
- Main Menu	General Setti	ngs		
Overview	DNS server 1			
Wizard	DNS server 2			
Basic Settings				
- Network Settings			Submit	
General Settings			Cubinit	
Ethernet/Bridge Settings				
- WLAN Settings				
Advanced Settings				
- Serial Port Settings				
- Modbus Address Mapping Ta	able			
- I/O Settings				
- System Management				
- System Monitoring				
- Restart				

On the General Settings page in the Network Settings folder, you can modify DNS server 1 and 2.

Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the DNS server's IP address, if applicable. With the DNS server configured,
	the NPort device server can use domain names instead of IP addresses to access hosts.
	Domain Name System (DNS) is how Internet domain names are identified and translated
	into IP addresses. A domain name is an alphanumeric name, such as www.moxa.com, that
	it is usually easier to remember than the numeric IP address. A DNS server is a host that
	translates a text-based domain name into an IP address in order to establish a TCP/IP
	connection. When the user wants to visit a particular website, the user's computer sends
	the domain name (e.g., www.moxa.com) to a DNS server to request that website's
	numeric IP address. When the IP address is received from the DNS server, the user's
	computer uses that information to connect to the website's web server.
	The NPort will play the role of a DNS client, actively querying the DNS server for the IP
	address associated with a particular domain name.

# DNS Server 1 and 2

# **Ethernet/Bridge Settings**

To enable the Ethernet-to-Wireless function, go to the **Ethernet/Bridge Settings** page and enable **Ethernet Bridge**.

MOXA	Total S	olution for Indust	trial Device Networking	
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
- Main Menu	1	work Settin	ng - Ethernet/Brid	lge
Overview	Ethernet bridg	e	Disable 🔻	
Wizard	IP configuration	n	Static 🔻	
Basic Settings	IP address		192,168,126,254	
- Network Settings	Netmask		255.255.255.0	
General Settings			255.255.255.0	
Ethernet/Bridge Setting	s Gateway			
- WLAN Settings				
Advanced Settings			Submit	

### Ethernet Bridge (for NPort IAW5000A-I/O Series)

Default	Disabled		
Options	Enabled / Disabled		
Description	This field specifies whether to enable <b>Ethernet Bridge</b> mode or not. When <b>Ethernet</b>		
	Bridge is enabled, the LAN and WLAN interfaces are bridged together. Data can be		
	seamlessly transferred between serial lines, LAN, and WLAN. The LAN and WLAN will use		
	the LAN IP setting, and WLAN IP setting will be disabled.		
	<b>Disabled:</b> When disabled, you can use either the LAN or WLAN.		
	<b>Enabled:</b> When enabled, you can use both the LAN and the WLAN.		
	Ethernet Serial		

### **IP Configuration**

Default	Static
Options	Static, DHCP, DHCP/BOOTP, BOOTP
Description	This field determines how the NPort's IP address will be assigned.
	Static: IP address, netmask, and gateway are user-defined.
	DHCP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server.
	DHCP/BOOTP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. IP address is assigned by BOOTP server if DHCP server does not respond.
	BOOTP: IP address is assigned by BOOTP server.

#### **IP Address**

Default	192.168.127.254 for the NPort IA5000A-I/O Series
	192.168.126.254 for the NPort IAW5000A-I/O Series' wired RJ45 Ethernet port
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address that will be assigned to your NPort device server. 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. If your device server will be assigned a dynamic IP address, set the "IP
	configuration" parameter appropriately.

### Netmask

Default	255.255.255.0
Options	Netmask setting (e.g., "255.255.0.0")
Description	This field is for the subnet mask. A subnet mask represents all of 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 device server 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 device server, a connection is
	established directly from the device server. Otherwise, the connection is established
	through the gateway as specified in the "Gateway" parameter.

# Gateway

Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address of the gateway, if applicable. A gateway is a network
	computer 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 device server needs to know the IP address of the default gateway computer in
	order to communicate with the hosts outside the local network environment. Consult your
	network administrator if you do not know how to set this parameter.



# ATTENTION

In dynamic IP environments, the NPort will send 3 requests every 30 seconds to the DHCP or BOOTP server until the network settings have successfully been assigned. The first request will time out after one second; the second request will time out after three seconds, and the third request will timeout after five second. If the DHCP or BOOTP server is unavailable, the NPort will use the factory default network settings.

# WLAN Settings (for the NPort IAW5000A-I/O Series)

# WLAN

<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-61/O - NPortIAW5150A-61/O_1 -	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
- Main Menu	WLAN Setting	AN Setting	s	
Overview Wizard Basic Settings - Network Settings General Settings Ethernet/Bridge Settings - WLAN Settings WLAN Profile WLAN Log Settings	IP configuratio IP address Netmask Gateway	'n	Static     ▼       192.168.126.254       255.255.255.0	

The WLAN page is located under WLAN Settings in the Network Settings folder. You can modify IP configuration, IP address, Netmask, and Gateway for your WLAN.

The NPort IAW5000A-I/O Series supports IEEE 802.11a/b/g/n wireless network interfaces. The supported IP configurations are static and dynamic (BOOTP, DHCP, or BOOTP+DHCP). Users can set up the IP configuration with the serial console, or the Web/Telnet consoles through the NPort's Ethernet interface. For detailed information about configuring **IP configuration**, **IP address**, **Netmask**, and **Gateway**, see the previous section, **Ethernet/Bridge Settings**.

Default	Static
Options	Static, DHCP, DHCP/BOOTP, BOOTP
Description	This field determines how the NPort's IP address will be assigned.
	Static: IP address, netmask, and gateway are user-defined.
	DHCP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server.
	DHCP/BOOTP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. IP address is assigned by BOOTP server if DHCP server does not respond.
	BOOTP: IP address is assigned by BOOTP server.

### **IP** Configuration

### **IP Address**

Default	192.168.127.254
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address that will be assigned to your NPort device server. 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 WLAN
	environment. If your device server will be assigned a dynamic IP address, set the "IP
	configuration" parameter appropriately.

### Netmask

Default	255.255.255.0
Options	Netmask setting (e.g., "255.255.0.0")
Description	This field is for the subnet mask. A subnet mask represents all of 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 device server 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 device server, a connection is
	established directly from the device server. Otherwise, the connection is established
	through the gateway as specified in the "Gateway" parameter.

### Gateway

Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address of the gateway, if applicable. A gateway is a network
	computer 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 device server needs to know the IP address of the default gateway computer in
	order to communicate with the hosts outside the local network environment. Consult your
	network administrator if you do not know how to set this parameter.

# Profile

The **Profile** page is located under **WLAN Settings** in the **Network Settings** folder. This is where you configure the NPort for Ad-hoc or Infrastructure operation. Different settings are available depending on whether you select Ad-hoc Mode or Infrastructure Mode.

	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - 1	MAC Address Firmware
	• Wi	reless LAN	<b>Profile Settings</b>	
Main Menu	Wireless LA	N Profile		
Overview	Network type		Infrastructure Mod	le 🔻
Wizard	Profile name		Infrastructure	
Basic Settings			General	Security
- Network Settings				
General Settings			Submit Activ	vate
Ethernet/Bridge Settings				ale
- WLAN Settings	Please remeh	er to activate Profile servi	ice by pressing "Activate" button af	ter configuring
WLAN	1 loade remes	er to activate i rome servi	ter by pressing viewate batter at	ter configuring.
Profile				
WLAN Log Settings				
Advanced Settings				
- Serial Port Settings				
- Modbus Address Mapping T	able			
- I/O Settings				
- System Management				
- System Monitoring				

# Network Type

Default	Infrastructure Mode		
Options	Infrastructure Mode, Ad-hoc Mode		
Description	This field specifies whether the NPort will operate in Ad-hoc or Infrastructure Mode. For all wireless networking devices, there are two possible modes for communication with another wireless device. Devices that are configured for Ad-hoc Mode automatically detect and communicate directly with each other and do not require a wireless access point (AP) or gateway. Wireless devices that are configured for Infrastructure Mode do not communicate directly with each other, but through a wireless access point (AP). Devices must be configured for the same mode in order to communicate with each other. Devices in Ad-Hoc Mode will only recognize other devices in Ad-Hoc Mode, and likewise for		
	devices in Infrastructure Mode. Example of Ad-Hoc Mode		
	WLAN HMI RS-232 RS-232 Flow meters Drives		
	Example of Infrastructure Mode		
	After setting the Network type, you will need to adjust the General and Security settings for the profile. In Ad-hoc Mode, only one profile is available. In Infrastructure Mode, three profiles can be defined.		

# **General Settings for WLAN Profile**

The **General** page is opened through the **Profile** page, under **WLAN Settings** in the **Network Settings** folder. You can type a profile name to help you differentiate one profile from another. It does not affect operation of the NPort. After selecting Ad-hoc or Infrastructure Mode, click **[General]** to open the General page for the selected profile. In Ad-hoc Mode, only one profile is available.

n Ad-hoc Mode				
ΜΟΧΛ	Total So	lution for Industri	al Device Networking	
	ortIAW5150A-61/O ortIAW5150A-61/O_1	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
	• Wir	eless LAN F	Profile Settings	
- Main Menu	Wireless LAN F	Profile		
Overview	Network type		Ad-hoc Mode	•
Wizard	Profile name		Adhoc	
Basic Settings	Frome name			
- Network Settings			General	Security
General Settings				
Ethernet/Bridge Settings			Submit Act	ivate
- WLAN Settings				
WLAN	Please remeber	to activate Profile service	e by pressing "Activate" button a	after configuring.
Profile			•	
Model - NPortIAW Name - NPortIAW		r Industrial Device N - 192.168.1: I No 1	-	ress - 44:39:C4:29:82:CC
Model - NPortIAW Name - NPortIAW Location -	5150A-6VO IP 5150A-6VO_1 Seria	- 192.168.12	26.254 ■ MAC Add Firmware	ress - 44:39:C4:29:82:CC
Model - NPortIAW Name - NPortIAW Location -	5150A-6VO IP 5150A-6VO_1 Seria • WLAN I General Properties	- 192.168.12 1No 1 Profile Proper	26.254 MAC Add Firmware	
Model - NPortIAW Name - NPortIAW Location -	5150A-6VO 5150A-6VO_1 Seria • WLAN I General Properties Profile name	- 192.168.12 1 No 1 Profile Proper	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC
Model - NPortIAW Name - NPortIAW Location -	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type	- 192.168.12 1 No 1 Profile Proper	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC - 1.0 Build 16102410
Model - NPortIAW Name - NPortIAW Location -	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type SSID	- 192.168.12 INO 1 Profile Propei	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC
Model - NPortIAW Name - NPortIAW Location - Main Menu Overview Wizard Basic Settings	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type	- 192.168.12 INO 1 Profile Propei	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC - 1.0 Build 16102410
Model - NPortIAW Name - NPortIAW Location - Main Menu Overview Wizard Basic Settings - Network Settings	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type SSID	- 192.168.12 INO 1 Profile Proper	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC - 1.0 Build 16102410
Model - NPortIAW Name - NPortIAW Location - NPortIAW Location - Network Wizard Basic Settings - Network Settings General Settings Ethernet/Bridge Settings - WLAN Settings	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type SSID	- 192.168.12 INO 1 Profile Propei	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC - 1.0 Build 16102410
Model Name Location Main Menu Overview Wizard Basic Settings - Network Settings General Settings Ethernet/Bridge Settings	5150A-6VO 5150A-6VO_1 • Seria • WLAN I General Properties Profile name RF type SSID	- 192.168.12 INO 1 Profile Proper	26.254 MAC Add Firmware	ress - 44:39:C4:29:82:CC - 1.0 Build 16102410

Name - NPortIAW5150A-6I/Q_1 Serial No1 Firmware -1.0 Build 16102410 Location - Image: Control of the series of the	Infrastructure Mo		Solution for Inde	ustrial Device	Networking	v
Main Menu       Overview         Wizard       Basic Settings         - Network Settings       Infrastructure         General Settings       - WLAN Settings         - WLAN Settings       Submit         - WLAN Settings       Please remeber to activate Profile service by pressing "Activate" button after configuring.         Profile       WLAN         Profile       Network/WS150AcMO_1         • Neord/WS150AcMO_1       • IP         • Neord/WS150AcMO_1       • IP         • Serial No.       • 1         • Neord/WS150AcMO_1       • IP         • Serial No.       • 1         • Iocation       • Nord/WS150AcMO_1         • Neord/WS150AcMO_1       • IP         • Serial No.       • 1         • Iocation       • Nord/WS150AcMO_1         • Neord/WS150AcMO_1       • IP         • Iocation       • Nord/WS150AcMO_1	Name				.126.254	
- main Menul       Overview         Wizard       Basic Settings         - Network Settings       General Settings         - WLAN Settings       Submit         - WLAN Settings       Profile name         WLAN       Profile         WLAN       Profile         WLAN       Profile         WLAN       Profile         WLAN Log Settings       Total Solution for Industrial Device Networking         WCONCON       - NPort/WS150A-600_1         Model       -NPort/WS150A-600_1         - NPort/WS150A-600_1       - 192:168:126:254         Model       -NPort/WS150A-600_1         - Nome       - 192:168:126:254         Marc Address       - 44:39:C4:29:82:CC         - NPort/WS150A-600_1       - 192:168:126:254         Marc Address       - 44:39:C4:29:82:CC         - Nome       - 10:Diulid 16:102:10         - Neoriew       - NPort/WS150A-600_1         Wcard       - NPort/WS150A-600_1         Basi: Settings       - Network Settings         - Network Settings       General Properties         Profile name       Infrastructure         RF type       Auto         Scan channels - 1       NA -         WLAN <t< td=""><td></td><td></td><td></td><td>N Profile</td><td>e Settings</td><td></td></t<>				N Profile	e Settings	
Wizard       Profile name       Infrastructure         Basic Settings       - Network Settings         Ceneral Settings       - WLAN Settings         - WLAN Settings       Profile name         WLAN       Profile         WLAN       Profile         WLAN Log Settings       Please remeber to activate Profile service by pressing "Activate" button after configuring.         Profile       WLAN Log Settings         Model       - NPort/AWD5150A-68/0         - NPort/AWD5150A-68/0       - 192-168-128-254         - NPort/AWD5150A-68/0       - 192-168-128-254         - NPort/AWD5150A-68/0       - 192-168-128-254         - Nortex       - NPort/AWD5150A-68/0         - NPort/AWD5150A-68/0       - 192-168-128-254         - NPort/AWD5150A-68/0       - 192-168-128-254         - Nortex       - NPort/AWD5150A-68/0         - Nortex       - NPort/AWD5150A-68/0         - NPort/AWD5150A-68/0       - 192-168-128-254         - Nortex       - NPort/AWD5150A-68/0         - Nortex       - NPort/AWD5150A-68/0         - Nortex       - NPort/AWD5150A-68/0         - Nortex       - NPort/AWD5150A-68/0         - Nortex       - Stole Properties         Profile name       Infrastructure		VVII eles:	S LAN PIONE			
Basic Settings - Network Settings General Settings Ethermet/Bridge Settings - WLAN Settings WLAN Profile WLAN Log Settings COCOCCC • Nodel • Nodel • Network/Statings • WLAN Log Settings • WLAN Log Settings • Network/Statings • Netw		Network	type		Infrastructure Mode •	
Network Settings General Settings Ethernet/Bridge Settings - WLAN Settings WLAN Profile WLAN Log Settings		Profile na	ame		Infrastructure	
Network Settings General Settings WLAN Profile WLAN Log Settings      Model     NortuAWS 150A-600     Settings      Model     NortuAWS 150A-600     Settings      Model     NortuAWS 150A-600     Settings      Model     NortuAWS 150A-600     Settings      Settings      Submit      Settings      NortuAWS 150A-600     Settings      Settings      Submit      NortuAWS 150A-600     Settings      Submit      Settings      Submit      Settings      Submit      Settings      Setting	Basic Settings			1	General	Security
Ethernet/Bridge Settings       Submit       Activate         •WLAN Settings       WLAN       Profile       Please remeber to activate Profile service by pressing "Activate" button after configuring.         •WLAN Log Settings       •WLAN Log Settings       •WWW.INOXAC         •WLAN Log Settings       •NortAW5150A-600       •192.168.126.254       •MAC Address       •44:39:C4:29.82:CC         •Nodel       •NPortAW5150A-600       •192.168.126.254       •MAC Address       •44:39:C4:29.82:CC         •Name       •NPortAW5150A-600_1       •192.168.126.254       •MAC Address       •44:39:C4:29.82:CC         •Nodel       •NPortAW5150A-600_1       •192.168.126.254       •MAC Address       •44:39:C4:29.82:CC         •Nodel       •Neotives       •Infastructure       •10.8041615102.410       •10.804161102.410         Overview       Wizard       Basic Settings	- Network Settings			L		*
Ethernet/Bridge Settings         •WLAN Settings         WLAN         Profile         WLAN Log Settings <b>Total Solution for Industrial Device Networking</b> •Model         •NPortAWS150A-6WO            •NortAWS150A-6WO             •Model         •NPortAWS150A-6WO            •NortAWS150A-6WO             •Main                  •NPortAWS150A-6WO <b>Main Menu Overview Wizard Basic Settings ChemetyBridge Settings ChemetyBridge Settings ChemetyBridge Settings ChemetyBridge Settings</b>	General Settings			Cubroi	Activate	
WLAN       Profile         WLAN Log Settings       Please remeber to activate Profile service by pressing "Activate" button after configuring.         WLAN Log Settings       Model         • Model       • NPortLAWS150A-600         • Nome       • NPortLAWS150A-600         • Nome       • NPortLAWS150A-600         • Name       • NPortLAWS150A-600         • NPortLAWS150A-600       • IP         • NPortLAWS150A-600       • 10         • NPortLAWS150A-600       • 10         • NPortLAWS150A-600       • 10         • NPortLAWS150A-600       • 10         • Network Settings       • NPortLAWS150A-600         • Ceneral Properties       Oterview         WLan       Sto         • Sto       profile         • Sto       profile         • NAN Settings       Scan channels - 1         • WLAN       Scan channels - 2         • WLAN       Scan channels - 3         • WLAN       Scan channels - 3         • WLAN       Settings         • VLAN       Settings	Ethernet/Bridge Settin	gs		Submi	Activate	
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<ul> <li>Model - NPortIAW5150A-6I/O - 1P - 192.168.126.254 MAC Address - 44:39:C4:29:82:CC - 1.0 Build 16102410</li> <li>Name - NPortIAW5150A-6I/O - 1</li> <li>Serial No1</li> <li>MAC Address - 44:39:C4:29:82:CC - 1.0 Build 16102410</li> <li>Entropoly - 100 Build 16102410</li> <li>Serial No1</li> <li>WLAN Profile Properties</li> <li>General Properties</li> <li>Profile name Infrastructure</li> <li>RF type Auto ▼</li> <li>SSID</li> <li>Fast roaming Disable ▼</li> <li>Scan channels - 1</li> <li>NIA ▼</li> <li>Scan channels - 3</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 3</li> <li>Scan channels - 3</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 3</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 2</li> <li>Scan channels - 3</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 44:39:C4:29:82:CC</li> <li>Scan channels - 100:82:80:80:80:80:80:80:80:80:80:80:80:80:8</li></ul>	WLAN Log Setting	S			- <b>-</b>	
Main Menu       General Properties         Overview       General Properties         Wizard       RF type         Basic Settings       Auto         - Network Settings       General Settings         General Settings       SID         Ethernet/Bridge Settings       Site Survey         WLAN       Scan channels - 1         Profile       Scan channels - 2         WLAN       Scan channels - 3         Profile       -70         WLAN Settings       -70         Advanced Settings       2         - Serial Port Settings       -70	Model - NF Name - NF	PortIAW5150A-6I/O	IP - 192	_		- 44:39:C4:29:82:CC - 1.0 Build 16102410
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- Network Settings     Fast roaming     Disable ▼       General Settings     Scan channels - 1     N/A ▼       Ethernet/Bridge Settings     Scan channels - 2     N/A ▼       - WLAN Settings     Scan channels - 3     N/A ▼       WLAN     Scan channels - 3     N/A ▼       Profile     Roaming threshold     -70 dBm (-70~40)       WLAN Log Settings     Roaming difference     2 dBm (2~10)	Basic Settings					Ofte Oversey
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- WLAN Settings     Scan channels - 2     N/A ▼       WLAN     Scan channels - 3     N/A ▼       Profile     Roaming threshold     -70       WLAN Log Settings     Roaming difference     2       Advanced Settings     -     -	General Settings					
WLAN Settings     Scan channels - 3     N/A •       WLAN     Scan channels - 3     N/A •       Profile     Roaming threshold     -70       WLAN Log Settings     Roaming difference     2       Advanced Settings     Serial Port Settings	Ethernet/Bridge Settings					
Profile Roaming threshold -70 dBm (-70~-40) WLAN Log Settings Advanced Settings	-					
WLAN Log Settings     Roaming difference     2     dBm (2~10)       Advanced Settings     Serial Port Settings						
Advanced Settings						
- Serial Port Sattings		Roaming difference	e	2 dB	m (2~10)	
Colorit						
- Modbus Address Mapping Table	-	ble	S	ubmit		

On the General page, you can configure **Profile name**, **RF Type**, and input an **SSID** provided by your WiFi AP. Additional settings are also available depending on whether you select **Ad-hoc Mode** or **Infrastructure Mode**.

### **Profile Name**

Default	Ad-hoc (in Ad-hoc Mode)
	Infrastructure (in Infrastructure Mode)
Options	free text (e.g., "Primary Connection")
Description	This is a free text field to help you differentiate one profile from another. It does not affect
	operation of the NPort.

# **RF** Type

Default	802.11b/g for Ad-Hoc Mode.
	Auto for Infrastructure Mode.
Options	802.11b/g only for Ad-Hoc Mode.
	Auto, 802.11a, 802.11b/g, 802.11a/n, 802.11b/g/n for Infrastructure Mode.
Description	This field determines which wireless standard will be used by the selected profile. 802.11a, 802.11b/g, 802.11a/n and 802.11b/g/n are supported.
	Auto: In Ad-hoc Mode, the NPort will scan the 2.4G wireless band and will automatically select the appropriate wireless standard for communication with any other wireless devices that are detected. In Infrastructure Mode, the NPort will automatically select between 802.11a, 802.11b/g, 802.11a/n and 802.11b/g/n according to the settings of the AP.
	802.11a: The Unlicensed National Information Infrastructure (UNII) 5 GHz band is used for communication, which is different from the RF band used by 802.11b and 802.11g. Consequently, 802.11a devices will not be able to communicate with 802.11b or 802.11g devices. (Multimode 802.11a/b/g APs or client adapters can be used to resolve this.) Transmission rates up to 54Mbps are supported.
	802.11b/g: This option means our device will support for 802.11b or 802.11g.
	802.11b: This is the well-known "Wi-Fi" standard, also referred to as "802.11 High-Rate (HR)." Wireless communication is in the 2.4 GHz ISM band, using the DSSS spread spectrum transmission scheme. 802.11b supports data rates of 1 Mbps, 2 Mbps, 5.5 Mbps, and 11 Mbps.
	802.11a/n: The option means our device will support up to 150 Mbps bandwidth to communicate to a 802.11a/n AP.
	802.11b/g/n: This option means our device will support up to 72.2 Mbps bandwidth to communicate to a 802.11b/g/n AP.

#### SSID

Default	Default
Options	Free text (e.g., "Coffeeshop WLAN")
Description	This field specifies the SSID, or name, of the wireless network (SSID) that will be used by
	the NPort. Wireless devices must use the same SSID in order to communicate with each
	other.

#### Site Survey

When you click **Site Survey**, the device server will scan for all the APs it can find nearby. It shows all the signal strengths between the device server and the APs. You may check the checkbox and click **OK** to create a profile for the specified AP.

192.168.126.254/wlan_site_survey.asp
--------------------------------------

SSID	Security	Signal Strength
<ul> <li>Avecovers</li> </ul>	WPA2-PSK	-86 dBm
O HEC 3140	WPA2-PSK	-81 dBm
© LD	None	-88 dBm
	None	-90 dBm
C Mittig-Methia	WPA2	-71 dBm
	WPA2-PSK	-71 dBm
O MACHE	WPA2	-88 dBm
O PrCL1	WPA2-PSK	-74 dBm
Sepido_5#270s_d15da3	WPA	-71 dBm
O UTEHO	WPA2	-74 dBm
O Uniteds	WPA2-PSK	-69 dBm
O LITERIODIO	WPA2-PSK	-71 dBm

OK Cancel

Refresh

### Channel (Ad-hoc mode only)

Default	1
Options	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Description	This field is for Ad-Hoc Mode only and specifies the radio channel to use for the wireless
	network.

### Fast Roaming (Infrastructure mode only)

Default	Disable
Options	Disable, Enable
Description	This field is only available in Infrastructure Mode and is used to specify the
	NPort IAW5000A-I/O roaming behavior. Roaming is the ability to connect to different APs
	so wireless communication is not confined to one area or one particular AP. The NPort
	IAW5000A-I/O will only roam between APs, as specified by the SSID.
	Disable: Fast Roaming function will be disabled.
	NPort IAW5000A-I/O will scan all available channels and roam between APs as specified by
	the SSID. It scans the channel when booting up and will associate with the highest signal
	strength AP. Only when the associated AP is loses, then it will re-associate again.
	Enable: Fast Roaming function will be enabled.
	NPort IAW5000A-I/O will only scan the pre-defined "Scan Channels - 1, Scan Channels
	- 2 & Scan Channels – 3" and roam between APs as specified by the SSID.
	It scans the channel and will associate with the highest signal strength AP. It also scans
	the channel regularly and will re-associate with the highest signal strength AP (if there is)
	by automatically.

# Scan channels – 1, Scan channels – 2, Scan channels – 3 (Infrastructure mode only)

Default	N/A
Options	1 through 14, 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140,
	149, 153, 157, 161
Description	This field is for fast roaming under Infrastructure Mode and specifies the radio channel to
	use for the wireless network. Choose the channel according to the factory setting of AP.

## **Roaming Threshold**

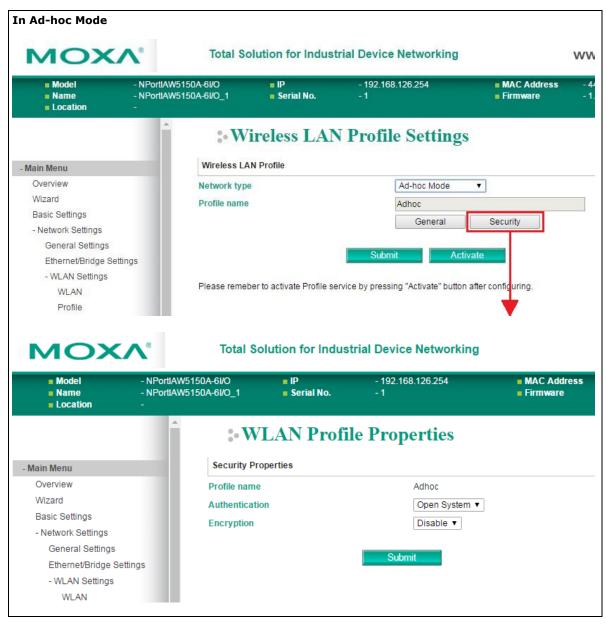
Default	-70 (Disable)
Options	numbers
Description	When the signal strength between the device and the AP is below -70 dBm (the default
	number), the device server will start to scan for a new AP to establish the connection.

#### **Roaming Difference**

Default	2 (Disable)
Options	numbers
Description	When the device server finds a new AP, the signal strength between device server and the
	new AP must be 2 dBm stronger than the signal strength between the device server and
	the the old AP for the device server to establish a new connection with the new AP. For
	example, if the signal strength with the old AP is -70 dBm and it is -69 dBm with the new
	AP, then the device server will keep the connection with the old one. If the signal strength
	with the new AP is -68 dBm, the device server will switch the connection to the new AP.

# **Security Settings for WLAN Profile**

The **Security** page is opened through the **Profile** page, under **WLAN Settings** in the **Network Settings** folder. After selecting Ad-hoc or Infrastructure Mode, click **[Security]** to open the Security page for the selected profile. In Ad-hoc Mode, only one profile is available, whereas three profiles are available in Infrastructure Mode.



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	NPortIAW5150A-6VO NPortIAW5150A-6VO_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
	•Wi	ireless LA	N Profile Settings	
- Main Menu	Wireless LA	N Profile		
Overview	Network type		Infrastructure Mode	
Wizard	Profile name		Infrastructure	
Basic Settings			General	Security
- Network Settings				occurry
General Settings			Submit Activat	0
Ethernet/Bridge Settings				
- WLAN Settings	Please remeb	er to activate Profile s	ervice by pressing "Activate" button afte	er contiaurina.
WLAN Profile				
Name -	Total S NPortlAW5150A-6I/O NPortlAW5150A-6I/O_1	colution for Ind IP Serial No.	ustrial Device Networking - 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
Model -	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	IP Serial No.	- 192.168.126.254	
Model - Name - Location -	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	IP Serial No. LAN Pro	- 192.168.126.254 - 1	
Model - Name - Location -	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties	
Model  Name  Location  Main Menu Overview	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties Infrastructure Open System •	
Model Name Location Main Menu Overview Wizard	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties	
Model Name Location Main Menu Overview Wizard Basic Settings	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties Infrastructure Open System • Disable •	
Model Name Location Main Menu Overview Wizard Basic Settings - Network Settings	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties Infrastructure Open System •	
Model - Name - Location - - Main Menu Overview Wizard Basic Settings - Network Settings General Settings	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul> VLAN Pro roperties e	- 192.168.126.254 -1 file Properties Infrastructure Open System • Disable •	

You will need to configure **Authentication** and **Encryption**. These settings must match the settings on the wireless device at the other end of the connection (such as the AP). Different settings and options are available depending on how **Authentication** and **Encryption** are configured.

#### Authentication

Default	Open System
Options	Open System, Shared Key, WPA, WPA-PSK, WPA2, WPA2-PSK
Description	This field specifies how wireless devices will be authenticated. Only authenticated devices will be allowed to communicate with the NPort. If a RADIUS server is used, this setting must match the setting on the RADIUS server.
	Open System: The NPort will simply announce a desire to associate with another station or access point. No authentication is required. For Ad-hoc Mode, this is the only option for authentication, since Ad-hoc Mode was designed for open communication.
	Shared Key: This option is only available in Infrastructure Mode. Authentication involves a more rigorous exchange of frames to ensure that the requesting station is authentic. WEP encryption is required.
	WPA: This is a managed authentication option that is only available in Infrastructure Mode. WPA was created by the Wi-Fi Alliance, the industry trade group that owns the Wi-Fi trademark and certifies devices with the Wi-Fi name. It is based on Draft 3 of the IEEE 802.11i standard. Each user uses a unique key for authentication, distributed from an IEEE 802.1X authentication server, also known as a RADIUS server. This option is also referred to as WPA Enterprise Mode, since it is intended to meet rigorous enterprise security requirements. Tunneled authentication is supported, depending on the EAP method selected.
	WPA-PSK: This is an unmanaged authentication option that is only available in Infrastructure Mode. Instead of a unique key for each user, a pre-shared key (PSK) is manually entered on the access point to generate an encryption key that is shared among all users. Consequently, this method does not scale well for enterprise. A PSK that uses a mix of letters, numbers and non-alphanumeric characters is recommended. This option is also referred to as WPA Personal Mode, since it is designed for the needs and capabilities of small home and office WLANs.
	WPA2: This is a managed authentication option that is only available in Infrastructure Mode. WPA2 implements the mandatory elements of 802.11i. Supported encryption algorithms include TKIP, Michael, and AES-based CCMP, which is considered fully secure. Since March 13, 2006, WPA2 has been mandatory for all Wi-Fi-certified devices. This option may also be referred to as WPA Enterprise Mode. Tunneled authentication is supported, depending on the EAP method selected.
	WPA2-PSK: This is an unmanaged authentication option that is only available in Infrastructure Mode. It employs WP2 encryption algorithms but relies on a PSK for authentication. A PSK that uses a mix of letters, numbers and non-alphanumeric characters is recommended. This option can also be referred to as WPA Personal Mode.

## Encryption

Default	Disable
Options	Disable, WEP, TKIP, AES-CCMP
Description	This field specifies the type of encryption to use during wireless communication. Different encryption methods are available depending on the <b>Authentication setting</b> . Also, each encryption method has its own set of parameters that may also require configuration.
	Disable: No encryption is applied to the data during wireless communication. This option is only available if <b>Authentication</b> is set to <b>Open</b> System.
	WEP: Wired Equivalent Privacy (WEP) is only available for Open System and Shared Key authentication methods. Data is encrypted according to a key. The NPort supports both 64 and 128-bit keys. This method may deter casual snooping but is not considered very secure.
	TKIP: Temporal Key Integrity Protocol (TKIP) is only available for WPA, WPA2, WPA-PSK, and WPA2-PSK authentication methods. TKIP is part of a draft standard from the IEEE 802.11i working group and utilizes the RC4 stream cipher with 128-bit keys for encryption and 64-bit keys for authentication. TKIP improves on WEP by adding a per-packet key mixing function to de-correlate the public initialization vectors (IVs) from weak keys.
	AES-CCMP: This is a powerful encryption method that is only available for WPA, WPA2, WPA-PSK, and WPA2-PSK authentication methods. Advanced Encryption Standard (AES) is the block cipher system used by the Robust Secure Network (RSN) protocol and is equivalent to the RC4 algorithm used by WPA. CCMP is the security protocol used by AES, equivalent to TKIP for WPA. Data undergoes a Message Integrity Check (MIC) using a well-known and proven technique called Cipher Block Chaining Message Authentication
	Code (CBC-MAC). The technique ensures that even a one-bit alteration in a message produces a dramatically different result. Master keys are not used directly but are used to derive other keys, each of which expire after a certain amount of time. Messages are encrypted using a secret 128-bit key and a 128-bit block of data. The encryption process is complex, but the administrator does not need to be aware of the intricacies of the computations. The end result is encryption that is much harder to break than even WPA.

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Default	
Options	free text (e.g., "This is the WLAN passphrase")
Description	This field is only available for WPA-PSK and WPA2-PSK authentication methods. If the
	NPort's passphrase does not match the AP's passphrase, the connection will be denied. A
	PSK of sufficient strength—one that uses a mix of letters, numbers and non-alphanumeric
	characters—is recommended.

#### **PSK Passphrase**

Security	Settings	for WEP	Encryption
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	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	Î :• WI	LAN Profi	le Properties		
Main Menu	Security Prop	perties			
Overview Wizard Basic Settings	Profile name Authentication Encryption	1	Adhoc Open System ▼ WEP ▼		
- Network Settings General Settings Ethernet/Bridge Settings - WLAN Settings WLAN Profile WLAN Log Settings Advanced Settings - Serial Port Settings	WEP key sour WEP key form WEP key 1 WEP key 2 WEP key 3 WEP key 4	x ce	64-bits ▼ 1 ▼ ● Manual ● Ge ASCII ▼	nerate WEP keys by passp	ihrase

When Encryption is set to WEP on the **Security** page for the WLAN profile, you will be able to configure **WEP key length**, **WEP key index**, and **WEP key source**. Other settings will be displayed depending on how **WEP key source** is configured.

#### WEP Key Length

Default	64bits
Options	64bits, 128bits
Description	This field specifies the length of the WEP key. 64bits is the industry standard for WEP, but
	128bits provides better protection.

#### **WEP Key Index**

Default	1
Options	1 through 4
Description	This field specifies the primary WEP key to use for the WLAN.

#### **WEP Key Source**

Default	Manual
Options	Manual, Generate WEP keys by passphrase
Description	This field specifies whether the WEP key will be generated manually or through a user-
	specified passphrase. A passphrase is equivalent to a free-text password that will be used
	to generate the WEP key. A passphrase is typically easier to remember and enter than a
	long and complicated WEP key.

#### **WEP Passphrase**

Default	
Options	free text (e.g., "This is the WEP passphrase")
Description	This field is only available if WEP key source is set to "Generate WEP keys by passphrase".
	A standard hexadecimal password will be generated using the supplied passphrase. For
	example, if "404tech" is entered, the WEP key will be "DB971608E942FC39BD89FC4ADB".

#### WEP Key Format

Default	ASCII
Options	ASCII, HEX
Description	This field is only available if WEP key source is set to "Manual". It specifies the format you
	will use to enter the WEP key.

## WEP Key 1 Through 4

Default				
Options	free text in ASCII or HI	EX		
Description	ASCII or HEX as specif	vailable if WEP key source ied in WEP key format. Th ey length and WEP key fo	ne number of character	
	WEP Key Length	WEP Key Format	Key Length	
	64bits	ASCII	5 characters	
		HEX	10 characters	
	128bits	ASCII	13 characters	
		HEX	26 characters	

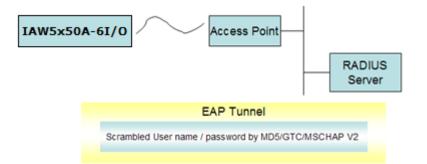
## Security Settings for WPA, WPA2

<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.12 - 1	6.254	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
	- • V	VLAN Profi	ile Proper	ties	
Main Menu	Security I	Properties			
Overview	Profile nan	ne	Iné	astructure	
Wizard					
Basic Settings	Authentica	ation		pen System 🔻 pen System	
- Network Settings	Encryption	1	· · · ·	hared Key	
General Settings				PA	
-			Submu	PA-PSK PA2	
Ethernet/Bridge Setti	igs				
Model - Ni	PortIAW5150A-6I/O			PA2-PSK	WWW.MOXa.Co
	PortIAW5150A-6I/O		Networking		
MOCAN <sup>®</sup> Model - Ni Name - Ni	PortIAW5150A-6I/O IIF PortIAW5150A-6I/O_1 IS	- 192.16	Networking 8.126.254	I AC Address	- 44:39:C4:29:82:CC
MOXA <sup>®</sup> Model - Ni Name - Ni	PortIAW5150A-6I/O IIF PortIAW5150A-6I/O_1 IS	9 - 192.164 erial No 1	Networking 8.126.254	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location -	PortIAW5150A-6I/O IF PortIAW5150A-6I/O_1 S	9 - 192.164 erial No 1	Networking 8.126.254	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location -	Port/AW5150A-6//O IF Port/AW5150A-6//O_1 S • WLAN Security Properties	9 - 192.164 erial No 1	e Networking 8.126.254 erties	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location -	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S • WLAN Security Properties Profile name	9 - 192.164 erial No 1	e Networking 8.126.254 erties	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location - Overview Wizard Basic Settings - Network Settings	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S • WLAN Security Properties Profile name Authentication	9 - 192.164 erial No 1	e Networking 8.126.254 erties Infrastructure WPA •	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location -	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S • WLAN Security Properties Profile name Authentication Encryption	9 - 192.164 erial No 1	e Networking 8.126.254 erties Infrastructure WPA • TKIP •	I AC Address	- 44:39:C4:29:82:CC
Model - Ni Name - Ni Location - Main Menu Overview Wizard Basic Settings - Network Settings General Settings	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S WLAN Security Properties Profile name Authentication Encryption EAP method	o - 192.16 erial No 1 N Profile Prop	e Networking 8.126.254 erties Infrastructure WPA • TKIP •	I AC Address	- 44:39:C4:29:82:CC
Model - N Name - N Location -	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S • WLAN Security Properties Profile name Authentication EAP method Username	erial No 1 N Profile Prop	e Networking 8.126.254 erties Infrastructure WPA • TKIP •	I AC Address	- 44:39:C4:29:82:CC
Model - N Name - N Location - N Verview Wizard Basic Settings - Network Settings General Settings Ethernet/Bridge Settings - WLAN Settings	PortIAW5150A-6I/O PortIAW5150A-6I/O_1 S • WLAN Security Properties Profile name Authentication Encryption EAP method Username Verify server certifica	erial No 1 N Profile Prop	e Networking 8.126.254 erties Infrastructure WPA • TKIP • TLS • Disable •	I AC Address	- 44:39:C4:29:82:CC

When WPA or WPA2 is used for authentication, you will also need to configure **EAP method** in the **Security** settings for the WLAN profile. Other settings will also be displayed depending on how **EAP method** is configured.

There are two parts to WPA and WPA2 security, authentication and data encryption.

 Authentication occurs before access is granted to a WLAN. Wireless clients such as the NPort IAW5000A-I/O Series are first authenticated by the AP according to the authentication protocol used by the RADIUS server. Depending on the WLAN security settings, an EAP tunnel can be used to scramble the username and password that is submitted for authentication purposes.



• Encryption occurs after WLAN access has been granted. For all wireless devices, data is first encrypted before wireless transmission, using mutually agreed-upon encryption protocol.

#### EAP Method

Default	PEAP
Options	TLS, PEAP, TTLS, LEAP
Description	This field specifies the EAP method to use for authentication. Four methods are supported.
	<ul> <li>TLS: Transport Layer Security (TLS) was created by Microsoft and accepted by the IETF as RFC 2716: PPP EAP TLS Authentication Protocol. Passwords and tunneled authentication are not used. A user certificate and user private key are used to identify the NPort. The NPort's user certificate and user private key must already be installed on the RADIUS server.</li> <li>PEAP: Protected Extensible Authentication Protocol (PEAP) is a proprietary protocol which was developed by Microsoft, Cisco and RSA Security.</li> </ul>
	TTLS: Tunneled Transport Layer Security (TTLS) is a proprietary protocol which was developed by Funk Software and Certicom, and is supported by Agere Systems, Proxim, and Avaya. TTLS is being considered by the IETF as a new standard. For more information on TTLS, read the draft RFC EAP Tunneled TLS Authentication Protocol. LEAP: Lightweight Extensible Authentication Protocol (LEAP) is a proprietary protocol which was developed by Cisco. LEAP doesn't check certificate during the authentication process.

#### **Tunneled Authentication**

Default	PAP (when using TTLS)	
	GTC (when using PEAP)	
Options	GTC, MD5, MSCHAP V2 (when using PEAP)	
	PAP, CHAP, MSCHAP, MSCHAP V2, EAP-MSCHAP V2, EAP-GTC, EAP-MD5 (when using	
	TTLS)	
Description	This field specifies the encryption method to use during the authentication process.	
	Different methods are available depending on the EAP Method setting.	

#### Username

Default	
Options	free text (e.g., "Smith_John")

Description	This field specifies the username that will be used to gain access to the WLAN. The correct
	username and password must be provided for access to be granted.

## Password

Default	
Options	free text (e.g., "Password123")
Description	This field specifies the password that will be used to gain access to the WLAN. The correct
	username and password must be provided for access to be granted.

#### **Anonymous Username**

Default		
Options	free text (e.g., "Anyuser")	
Description	This field specifies the anonymous username to use when initiating authentication. After	
	the RADIUS Server has been verified by certificate, the true username and password will	
	be used to complete the authentication process.	

#### **Verify Server Certificate**

Default	Disable
Options	Disable, Enable
Description	Disable: The certificate from the RADIUS server will be ignored.
	Enable: The certificate from the RADIUS server will be used to authenticate access to the WLAN. The RADIUS server's trusted server certificate must already be installed on the NPort. To install a trusted server certificate, visit the corresponding page in the System Management> Certificate folder.

#### **Trusted Server Certificate**

This field is available for PEAP, TLS, and TTLS EAP methods only. It displays information on the trusted server certificate that is installed on the NPort. To install a trusted server certificate, visit the corresponding page in the **System Management > Certificate** folder.

#### **User Certificate**

This field is available only when EAP method has been set to TLS. It displays information on the user certificate that is installed on the NPort. To install a user certificate, visit the corresponding page in the **System Management > Certificate** folder.

#### **User Private Key**

This field is available only when EAP method has been set to TLS. It displays information on the user private key on the NPort.

## **WLAN Log Setting**

ΜΟΧΛ <sup>®</sup>	Total Solution for Industrial Device Networking				
	ortlAW5150A-61/O ortlAW5150A-61/O_1	■ IP ■ Serial No.	- 192.168.126.254 - 1	MAC Address	
- Main Menu	WLAN Log	LAN Log S Settings	Settings		
Overview	WLAN Log		Disable 🔻		
Wizard	1.000000000				
Basic Settings			Submit		
- Network Settings					
General Settings					
Ethernet/Bridge Settings					
- WLAN Settings					
WLAN					
Profile					
WLAN Log Settings					

#### **WLAN Log Settings**

	-	
Default	Disable	
Options	Disable, Enable	
Description	When the wireless connection between the device server and the AP is not stable, you	
	may enable this function to have more information available for troubleshooting. You may	
	find System Monitoring $\rightarrow$ System Status $\rightarrow$ WLAN Log for the detail logs. Before	
	calling Moxa for help, please enable this function first to collect some information.	

## **Advanced Settings**

■ Model ■ Name	- NPortIAW5150A-61/O - NPortIAW5150A-61/O_1	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
Location	-	lvanced Se	ttings		
- Main Menu Overview Wizard Basic Settings	Gratuitous A		Enable V 180		
- Network Settings General Settings	IP/MAC addr IP/MAC addr IP/MAC addr	esses 2		MAC MAC MAC	
Ethernet/Bridge Setting - WLAN Settings WLAN	js IP/MAC addr		IP	MAC	
Profile WLAN Log Settings Advanced Settings			Submit		

On the Advanced Settings page in the Network Settings folder, you can modify Gratuitous ARP.

## Gratuitous ARP

Default	Enabled
Options	Enable / Disable

Description	Gratuitous ARP requests provide duplicate IP address detection. The NPort sends
	broadcast packets to update ARP tables on other devices (e.g., AP, PC) periodically. We
	can use this function to notify networked devices that the NPort is still alive. Morever, the
	NPort can send Gratuitous ARP for legacy devices that do not have this function.
	If you want the NPort to send Gratuitous ARP for legacy devices, you should enter the
	legacy devices' IP and Mac addresses in "IP/MAC address" field.

#### Send Period

Default 180 seconds	
Options	10-1000 seconds
Description	This field specifies how long the NPort periodically sends Gratuitous ARP.

## IP/MAC Addresses (for the NPort IAW5000A-I/O Series)

Default	N/A
Options	IP address and MAC address of the legacy device (e.g., IP: "192.168.1.1", MAC:
	"11:22:33:44:AA:11"). This function only available when <b>Ethernet Bridge</b> is enabled.
Description	IP address: legacy device IP address.
	MAC address: legacy devices MAC address.

# Web Console: Serial Port Settings

The following topics are covered in this chapter:

#### □ Overview

- Serial Port Settings
- Communication Parameters
- > Data Buffering/Log

## **Overview**

This chapter explains how to configure all settings located under the **Serial Port Settings** folder in the NPort web console.

## **Serial Port Settings**

## **Operation Modes**

Each serial port on the NPort is configured through the hyperlink below the column of **Operating mode**.

ΜΟΧΛ	8	Total Solution for Industrial Device Networking					www.moxa.com
	NPortIAW5150/ NPortIAW5150/			- 192.168.126.254 - 1		<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
		:• Opera	ation Mode	es			
- Main Menu	Port	Operating mode	Packing length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit
Overview	1	P. J. COLL	0	00 (Disable)	00 (Disable)	Do Nothing	0
Wizard	1	Real COM	Max connection:	1			
Basic Settings - Network Settings - Serial Port Settings Operation Modes Communication Parame Data Buffering/Log	eters	Click for Por	t Setting				

Click the link of **Real COM**, it will show the Port settings page. The Operation Modes page for each serial port is where you configure the serial port's operation mode and related settings. For an introduction to the different operation modes, please refer to Chapter 4.

MOX/	Total S	Total Solution for Industrial Device Networking			
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254  MAC Address - 44:39:C4:29:82:CC - 1 Firmware - 1.0 Build 16102410		
	:•0	peration M	odes		
- Main Menu	Port Setting	gs			
Overview	Port		1		
Wizard	Operation m	iode	Real COM 🔹		
Basic Settings	TCP alive cl	neck time	7 (0 - 99 min)		
- Network Settings	Max connec	tion	1		
- Serial Port Settings	Ignore jamn		Disable V		
Operation Modes					
Communication Para			Disable 🔻		
Data Buffering/Log	Connection	goes down	RTS 🔵 always low 💿 always high		
- Modbus Address Mapp	ing Table		DTR 🔵 always low 💿 always high		
- I/O Settings	Data Packi	ng			
- System Management	Packet leng	th	0 (0 - 1024)		
- System Monitoring	Delimiter 1				
- Restart	Delimiter 2				
goahead			00 (HEX) Enable		
Best viewed with IE 5 abo resolution 1024 x 76	ove at Force trans		Do Nothing • (Processed only when Packing length is 0) 0 (0 - 65535 ms)		
			Submit		

#### **Operation Mode**

Default	Real COM
Options	Real COM, RFC2217, TCP Server, TCP Client, UDP, IoT, Pair Connection Master, Pair
	Connection Slave, Ethernet Modem, Reverse Terminal
Description	Along with Application, this field specifies the serial port's operation mode, or how it will
	interact with network devices. Depending on how Application is configured, different
	options are available for Mode. Depending on how Mode is configured, additional settings
	will be available for configuration. For an introduction to the different operation modes,
	please refer to Chapter 4.
	Real COM: This serial port will operate in Real COM mode.
	RFC2217: This serial port will operate in RFC2217 mode.
	TCP Server: This serial port will operate in TCP Server mode.
	TCP Client: This serial port will operate in TCP Client mode.
	UDP: This serial port will operate in UDP mode.
	IoT: This serial port will operate in IoT mode
	Pair Connection Master: This serial port will operate in Pair Connection Master mode.
	Pair Connection Slave: This serial port will operate in Pair Connection Slave mode.
	Ethernet Modem: This serial port will operate in Ethernet Modem mode.
	Reverse Terminal: This serial port will operate in Reverse Terminal mode.

## **Settings for Real COM Mode**

	tiaw5150a-61/0 tiaw5150a-61/0_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:C0 - 1.0 Build 1610241
Main Menu	Port Setting	peration M	odes		
Overview	Port		1		
Wizard	Operation m	odo	Real COM	•	
Basic Settings	TCP alive ch				
- Network Settings			7 (0 - 99 r	min)	
- Serial Port Settings	Max connect	tion	1 🔻		
Operation Modes	Ignore jamm	ed IP	Disable 🔻		
Communication Parameters	Allow driver	control	Disable 🔻		
Data Buffering/Log	Connection	goes down	RTS 🔵 always lo	w 💿 always high	
- Modbus Address Mapping Table	e		DTR 🔘 always lo	ow 💿 always high	
- I/O Settings	Data Packir	na			
- System Management					
- System Monitoring	Packet lengt	m	0 (0 - 1		
- Restart	Delimiter 1		00 (HEX)	Enable	
	Delimiter 2		00 (HEX)	Enable	
goahead WEBSERVER	Delimiter pro	ocess	Do Nothing 🔻	(Processed only when Pac	king length is 0)
est viewed with IE 5 above at resolution 1024 x 768	Force transr	nit	0 (0 - 6	5535 ms)	

When **Operation Mode** is set to Real COM on a serial port's **Operation Modes** page, you will be able to configure additional settings including **TCP alive check time**, **Max connection**, **Ignore jammed IP**, **Allow driver control, connection goes down**, **Packet length**, **Delimiter 1**, **Delimiter 2**, **Delimiter process**, and **Force transmit**.

## TCP alive check time

Default	7 min				
Options	0 to 99 min				
Description	This field specifies how long the NPort will wait for a response to "keep alive" packets				
	before closing the TCP connection. The NPort checks connection status by sending periodic				
	"keep alive" packets.				
	0: The TCP connection will remain open even if there is no response to the "keep alive" packets.				
	1 to 99: If the remote host does not respond to the packet within the specified time, the				
	NPort will force the existing TCP connection to close.				

## Max connection

Default	1
Options	1 to 8
Description	This field specifies the maximum number of connections that will be accepted by the serial
	port.
	1: Only one specific host can access this serial port, and the RealCOM driver on that host
	will have full control over the port.
	2 to 8: This serial port will allow the specified number of connections to be opened
	simultaneously. With simultaneous connections, the Real COM driver will only provide a
	pure data tunnel with no control ability. The serial communication will be determined by
	the NPort rather than by your application program. Application software that is based on
	the Rea ICOM driver will receive a driver response of "success" when using any of the
	Win32 API functions. The NPort will send data only to the Real COM driver on the host.
	Data received from hosts will be sent to the attached serial device on a first-in-first-out
	basis.



#### ATTENTION

When Max connection is 2 or greater, the serial port's communication settings (i.e., baudrate, parity, data bits, etc.) will be determined by the NPort. Any host that opens the COM port connection must use identical serial communication settings.

## Ignore jammed IP

Default	Disable
Options	Disable, Enable
Description	This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the serial port. Disable: All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded. Enable: Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.

#### Allow driver control

Default	Disable
Options	Disable, Enable

Description	This field specifies how the port will proceed if driver control commands are received from
	multiple hosts that are connected to the port.
	Disable: Driver control commands will be ignored.
	Enable: Control commands will be accepted, with the most recent command received
	taking precedence.

#### **Connection goes down**

-	
Default	always high
Options	always low, always high
Description	This field specifies what happens to the RTS and DTR signals when the Ethernet
	connection goes down. For some applications, serial devices need to know the Ethernet
	link status through RTS or DTR signals sent through the serial port.
	Always low: The selected signal will change to low when the Ethernet connection goes down.
	Always high The selected signal will remain high when the Ethernet connection goes down.

#### Packet length

Default	0
Options	0 to 1024
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.
	1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.

## Delimiter 1 and 2

Default	Disabled
Options	Disabled, Enabled, 00 to FF
Description	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level.



#### ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

#### **Delimiter process**

Default	Do Nothing
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter

Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.

#### **Force transmit**

Default	0 ms
Options	0 to 65535
Description	This field controls data packing by the amount of time that elapses between bits of data.
	0: If serial data is not received, the NPort will wait indefinitely for additional data. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on 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. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.

## Settings for RFC2217 Mode

	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	:•Op	eration M	odes		
Main Menu	Port Settings	5			
Overview Wizard Basic Settings - Network Settings - Serial Port Settings Operation Modes	Port Operation mo TCP alive che TCP port Data Packing	eck time	1 RFC2217 7 (0 - 99 n 4001	▼] nin)	
Communication Paramet Data Buffering/Log - Modbus Address Mapping - I/O Settings - System Management - System Monitoring - Restart	Delimiter 1	cess	00 (HEX)	Enable	king length is 0)

When **Operation Mode** is set to **RFC2217** on a serial port's **Operation Modes** page, you will be able to configure additional settings, including **TCP alive check time**, **TCP port**, **Packet length**, **Delimiter 1**, **Delimiter 2**, **Delimiter process**, and **Force transmit**.

## TCP alive check time

Default	7 min	
Options	0 to 99 min	
Description	This field specifies how long the NPort will wait for a response to "keep alive" packets	
	before closing the TCP connection. The NPort checks connection status by sending periodic	
	"keep alive" packets.	
	0: The TCP connection will remain open even if there is no response to the "keep alive" packets.	
	1 to 99: If the remote host does not respond to the packet within the specified time, the NPort will force the existing TCP connection to close.	

#### **TCP Port**

Default	4001	
Options		
Description	ion This field specifies the TCP port number that the serial port will use to listen to	
	connections, and that other devices must use to contact the serial port.	

#### **Packet length**

Default	0
Options	0 to 1024
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending.
	0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.
	1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.

#### Delimiter 1 and 2

Default	Disabled	
Options	Disabled, Enabled, 00 to FF	
Description	These fields are used to define special delimiter character(s) for data packing. Enable	
	Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2	
	to control data packing with two characters received in sequence.	
	When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process.	
	Delimiters must be incorporated into the data stream at the software or device level.	

## **Delimiter process**

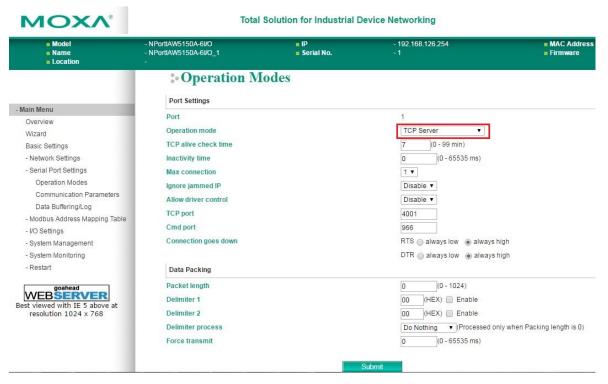
Default	Do Nothing
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter

Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.

#### **Force transmit**

Default	0 ms				
Options	0 to 65535				
Description	This field controls data packing by the amount of time that elapses between bits of data.				
	0: If serial data is not received, the NPort will wait indefinitely for additional data.				
	to 65535: If serial data is not received for the specified amount of time, the data that is				
	currently in the buffer will be packed for network transmission. The optimal force transmit				
	time depends on 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. In this case, the total number of bits				
	needed to send a character is 10 bits, and the time required to transfer one character is				
	8.3 ms, so the force transmit time to be larger than 8.3 ms.				

## **Settings for TCP Server Mode**



When **Operation Mode** is set to **TCP Server** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Inactivity time**, **Max connection**, **Ignore** 

jammed IP, Allow driver control, TCP port, Cmd port, Connection goes down, Packet length, Delimiter 1, Delimiter 2, Delimiter process, and Force transmit.

**TCP** alive check time

Default 7 min

## Ignore jammed IP

Default	Disable
Options	Disable, Enable
Description	This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the serial port. Disable: All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded. Enable: Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.

## Allow driver control

Default	Disable
Options	Disable, Enable
Description	This field specifies how the port will proceed if driver control commands are received from multiple hosts that are connected to the port.
	Disable: Driver control commands will be ignored.
	Enable: Control commands will be accepted, with the most recent command received
	taking precedence.

#### **TCP** port

•		
Default	4001	
Options	0 to 9999	
Description	This field specifies the TCP port number that the serial port will use to listen to	
	connections, and that other devices must use to contact the serial port.	

#### Cmd port

Default	966
Options	
Description	This field specifies the TCP port number for listening to SSDK commands from the host.

## **Connection goes down**

Default	always high			
Options	always low, always high			
Description	his field specifies what happens to the RTS and DTR signals when the Ethernet			
	connection goes down. For some applications, serial devices need to know the Ethernet			
	link status through RTS or DTR signals sent through the serial port.			
	Always low: The selected signal will change to low when the Ethernet connection goes down.			
	Always high The selected signal will remain high when the Ethernet connection goes down.			

## Packet length

Default	0
Options	0 to 1024
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending.
	0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.
	1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.

#### Delimiter 1 and 2

Default	Disabled
Options	Disabled, Enabled, 00 to FF
Description	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process.
	Delimiters must be incorporated into the data stream at the software or device level.



#### ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

## **Delimiter process**

Default	Do Nothing			
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter			
Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.			
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.			
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.			
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.			
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.			

#### **Force transmit**

Default	0 ms				
Options	0 to 65535				
Description	This field controls data packing by the amount of time that elapses between bits of data.				
	When using this field, make sure that 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.				
	0: If serial data is not received, the NPort will wait indefinitely for additional data.				
	1 to 65535: If serial data is not received for the specified amount of time, the data that is				
	currently in the buffer will be packed for network transmission. The optimal force transmit				
	time depends on 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. In this case, the total number of bits				
	needed to send a character is 10 bits, and the time required to transfer one character is				
	8.3 ms, so the force transmit time to be larger than 8.3 ms.				

## **Settings for TCP Client Mode**

ΜΟΧΛ	Total Solution for Industrial Device Networking			www.moxa.com	
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	: Operati	ion Modes			
Main Menu	Port Settings				
Verview Wizard Basic Settings - Network Settings - Serial Port Settings Operation Modes Communication Parameters Data Buffering/Log - Modbus Address Mapping Tab - UO Settings - System Monitoring - Restart Sest viewed with IE 5 above at resolution 1024 x 768	Port Operation mode TCP alive check time Inactivity time Ignore jammed IP Destination address Destination address	1 2 3 4 1 1 2 3	1 TCP Client 7 (0 - 99 min) 0 (0 - 65535 Disable ▼ 5010 5011 5012 5013 Startup/None 0 (0 - 1024) 00 (HEX) ■ Ena 00 (HEX) ■ Ena 00 (HEX) ■ Ena 00 (HEX) ■ Ena 00 (0 - 65535	ble ble ble ccessed only when Packing length is	Port 4001 Port 4001 Port 4001 Port 4001

When **Operation Mode** is set to **TCP Client** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Inactivity time**, **Ignore jammed IP**, **Destination address 1-4**, **Designated local port 1-4**, **Connection control**, **and Packet length**, **Delimiter 1**, **Delimiter 2**, **Delimiter process**, and **Force transmit**.

#### **TCP** alive check time

Default	7 min			
Options	0 to 99 min			
Description	his field specifies how long the NPort will wait for a response to "keep alive" packets			
	before closing the TCP connection. The NPort checks connection status by sending periodic			
	"keep alive" packets.			
	0: The TCP connection will remain open even if there is no response to the "keep alive" packets.			
	1 to 99: If the remote host does not respond to the packet within the specified time, the			
	NPort will force the existing TCP connection to close.			

#### **Inactivity time**

0 ms
0 to 65535 ms
This field specifies the time limit for keeping the connection open if no data flows to or from the serial device.
0: The connection will remain open even if data is never received. For many applications, the serial device may be idle for long periods of time, so 0 is an appropriate setting.
1 to 65535: If there is no activity for the specified time, the connection will be closed. When adjusting this field, 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.

#### Ignore jammed IP

Default	Disable
Options	Disable, Enable
Description	This field specifies how an unresponsive IP address is handled when there are
	simultaneous connections to the serial port.
	Disable: All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded.
	Enable: Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.

#### Destination address 1 to 4

Default	4001
Options	IP address and port (e.g., "192.168.1.1" and "4001")
Description	This field specifies the remote host(s) that will access the attached device. At least one
	destination must be provided. This field supports the use of domain names and names
	defined in the host table.



#### ATTENTION

In TCP Client mode, up to 4 connections can be established between the serial port and TCP hosts. The connection speed or throughput may be low if any one of the four connections is slow, since the one slow connection will slow down the other 3 connections.

#### Designated local port 1 to 4

Default	5010 to 5013
Options	1 to 65535
Description	This field specifies the TCP port number that will be used for data transmission with the serial port.

## **Connection control**

Default	Startup/None			
Options	Startup/None, Any Character/None, Any Character/Inactivity Time, DSR On/DSR Off, DSR On/None, DCD On/DCD Off, DCD On/None			
Description	This field specifies how connections to the device are established and closed.			
	Startup/None: The connection will be opened as the NPort starts up. The connection will only be closed manually.			
	Any Character/None: The connection will be opened as soon as a character is received from the attached device. The connection will only be closed manually.			
	Any Character/Inactivity Time: The connection will be opened as soon as a character is received from the attached device. The connection will be closed if no data is received for the time specified in Inactivity time.			
	DSR On/DSR Off: The TCP connection is opened when the DSR signal is on, and closed when the DSR signal is off.			
	DSR On/None: The TCP connection is opened when the DSR signal is on. The connection will only be closed manually.			
	DCD On/DCD Off: The TCP connection is opened when the DCD signal is on, and closed when the DCD signal is off.			
	DCD On/None: The TCP connection is opened when the DCD signal is on. The connection will only be closed manually.			

#### Packet length

Default	0
Options	0 to 1024
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending.
	0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.
	1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.

## Delimiter 1 and 2

Default	Disabled
Options	Disabled, Enabled, 00 to FF
Description	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level.



## ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

#### **Delimiter process**

Default	Do Nothing				
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter				
Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.				
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.				
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.				
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.				
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.				

#### Force transmit

Default	0 ms				
Options	0 to 65535				
Description	This field controls data packing by the amount of time that elapses between bits of data.				
	When using this field, make sure that 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.				
	0: If serial data is not received, the NPort will wait indefinitely for additional data.				
	1 to 65535: If serial data is not received for the specified amount of time, the data that is				
	currently in the buffer will be packed for network transmission. The optimal force transmit				
	time depends on 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. In this case, the total number of bits				
	needed to send a character is 10 bits, and the time required to transfer one character is				
	8.3 ms, so the force transmit time to be larger than 8.3 ms.				

## **Settings for UDP Mode**

Model	- NPortIAW5150A-6I/O	IP	- 192.168.126.254	MAC Address	- 44:39:C4:29:82:CC
<ul> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O_1 -	Serial No.		<b>=</b> Firmware	- 1.0 Build 16102410
	: Opera	tion Modes			
Main Menu	Port Settings				
Overview	Port		1		
Wizard	Operation mode		UDP	•	
Basic Settings	Destination address	s 1	Begin	End	Port 4001
- Network Settings	Destination address	\$ 2	Begin	End	Port 4001
- Serial Port Settings	Destination address	\$ 3	Begin	End	Port 4001
Operation Modes	Destination address		Begin	End	Port 4001
Communication Parameters Data Buffering/Log	Local listen port	3 4	4001		1011 4001
- Modbus Address Mapping Tab			4001		
- I/O Settings	Data Packing				
- System Management	Packet length		0 (0 - 102	(4)	
- System Monitoring	Delimiter 1		00 (HEX) 🔲 E	nable	
- Restart	Delimiter 2		00 (HEX) 🔲 E	nable	
	Delimiter process		Do Nothing 🔻 (I	Processed only when Packing lengt	n is 0)
	Force transmit		0 (0 - 655	35 ms)	
Best viewed with IE 5 above at					

When **Operation Mode** is set to **UDP** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **Destination address 1** through **4**, **Local listen port**, **Packet length**, **Delimiter 1**, **Delimiter 2**, **Delimiter process**, and **Force transmit**.

#### Destination address 1 to 4

Default	
Options	IP address range and port (e.g., "192.168.1.1" to "192.168.1.64" and "4001")
Description	In UDP mode, you may specify up to 4 ranges of IP addresses for the serial port to connect to. At least one destination range must be provided.
	The maximum selectable IP address range is 64 addresses. However, you can enter multicast addresses in the Begin field, in the form xxx.xxx.255. For example, enter "192.127.168.255" to allow the NPort to broadcast UDP packets to all hosts with IP addresses between 192.127.168.1 and 192.127.168.254.

#### Local listen port

Default	4001
Options	
Description	This field specifies the UDP port that the NPort listens to and that other devices must use
	to contact the attached serial device.

## Packet length

Default	0
Options	0 to 1024
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending.
	<ul><li>0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.</li><li>1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.</li></ul>

#### Delimiter 1 and 2

Default	Disabled			
Options	Disabled, Enabled, 00 to FF			
Description	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process.			
	Delimiters must be incorporated into the data stream at the software or device level.			



#### ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

#### **Delimiter process**

beinnter pi				
Default	Do Nothing			
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter			
Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.			
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.			
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.			
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.			
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.			

#### Force transmit

Default	0 ms	
Options	0 to 65535	
Description	This field controls data packing by the amount of time that elapses between bits of data.	
	When using this field, make sure that 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.	
	0: If serial data is not received, the NPort will wait indefinitely for additional data.	
	1 to 65535: If serial data is not received for the specified amount of time, the data that is	
	currently in the buffer will be packed for network transmission. The optimal force transmit	
	time depends on 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. In this case, the total number of bits	
	needed to send a character is 10 bits, and the time required to transfer one character is	
	8.3 ms, so the force transmit time to be larger than 8.3 ms.	

## **Settings for IoT Mode**

	• Operation Mode				
- Main Menu	Port Settings				
Overview	Port	1			
Wizard	Operation mode	IoT			
Basic Settings - Network Settings	Sniffer mode	Enable (Subscribed messages will be dropped)			
- IoT Management	Data Packing				
IoT Mode	Packet length	0 (0 - 2880)			
IoT Connection Monitoring	Delimiter 1	00 (HEX) 🔲 Enable			
IoT Data Buffering	Delimiter 2	00 (HEX) Enable			
- Serial Port Settings	Delimiter process	Do Nothing (Processed only when the packet length is 0)			
Operation Mode Communication Parameters	Force transmit	0 (0 - 65535 ms)			
Port Buffering/Log					
- I/O Settings		Submit			
- Remote I/O Access					
- System Management					
- System Monitoring					
- Restart					

When Operation Mode is set to IoT on a serial port's Operation Modes page, you will be able to configure additional settings such as Sniffer mode, Packet length, Delimiter 1, Delimiter 2, Delimiter process, and Force transmit.

#### **Sniffer Mode**

When the user connects the serial port to an existing RS-485 bus to capture the serial traffic between the master and slave and then uploads them to the cloud. The user may not want the NPort device server to pass any messages from the cloud platform to the serial port to disturb the master and slave's communication. In this scenario, please enable the Sniffer mode, so the NPort device server can discard all the messages initialed from the cloud platform.

Default	0
Options	0 to 2880
Description	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. Each cloud platform may have its own packet header or tail format, so the maximum packet size for user usage may be different and cannot reach the
	exact size the cloud platform can accept. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full.
	0 to 2880: Data in the buffer will be sent as soon it reaches the specified length.

#### **Packet Length**

## Delimiter 1 and 2

Default	Disabled			
Options	Disabled, Enabled, 00 to FF			
Description	These fields are used to define special delimiter character(s) for data packing. Enable			
	Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2			
	to control data packing with two characters received in sequence.			
	When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level.			



## ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

#### **Delimiter Process**

Default	Do Nothing		
Options	Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter		
Description	This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.		
	Do nothing: Data accumulated in the serial port's buffer will be packed, including delimiters.		
	Delimiter + 1: One additional character must be received before the data in the serial port's buffer is packed.		
	Delimiter + 2: Two additional characters must be received before the data in the serial port's buffer is packed.		
	Strip Delimiter: Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.		

#### **Force Transmit**

Default	0 ms			
Options	0 to 65535			
Description	This field controls data packing by the amount of time that elapses between bits of data			
	When using this field, make sure that 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.			
	0: If serial data is not received, the NPort will wait indefinitely for additional data.			
	1 to 65535: If serial data is not received for the specified amount of time, the data that is			
	currently in the buffer will be packed for network transmission. The optimal force transmit			
	time depends on 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			
	1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits			
	needed to send a character is 10 bits, and the time required to transfer one character is			
	8.3 ms, so the force transmit time to be larger than 8.3 ms.			

## Settings for Pair Connection Master Mode and Pair Connection Slave

### Mode

ΜΟΧΛ	Total S	olution for Industria	al Device Networking		www.moxa.com
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	:• Operat	tion Modes			
- Main Menu	Port Settings				
Overview Wizard Basic Settings	Port Operation mode		1 Pair Connection Master ▼		
- Network Settings - Serial Port Settings	TCP alive check tim Destination address		7(0 - 99 min)		Port 4001
Operation Modes		1	Submit		
Communication Parametei Data Buffering/Log					
		Solution for Industri = IP = Serial No.	al Device Networking - 192.168.126.254 - 1	■ MAC Address ■ Firmware	WWW.MOX3.COF - 44:39:C4:29:82:CC - 1.0 Build 16102410
Data Buffering/Log	Total \$ - NPortIAW5150A-6i/O - NPortIAW5150A-6i/O_1 -	∎ IP	- 192.168.126.254		- 44:39:C4:29:82:CC
Data Buffering/Log	Total \$ - NPortIAW5150A-6i/O - NPortIAW5150A-6i/O_1 -	∎ IP ∎ Serial No.	- 192.168.126.254		- 44:39:C4:29:82:CC
Data Buffering/Log	Total S - NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 - Opera	∎ IP ∎ Serial No.	- 192.168.126.254		- 44:39:C4:29:82:CC
Data Buffering/Log  Model  Mame Location	Total S - NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 - - Port Settings	∎ IP ∎ Serial No.	- 192.168.126.254 - 1		- 44:39:C4:29:82:CC
Data Buffering/Log  Model Mame Location  Main Menu Overview Wizard Basic Settings	Total S - NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 - Port Settings Port	■ IP ■ Serial No. tion Modes	- 192.168.126.254 - 1		- 44:39:C4:29:82:CC
Data Buffering/Log	Total S - NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 - - Port Settings Port Operation mode	■ IP ■ Serial No. tion Modes	- 192.168.126.254 - 1 1 Pair Connection Slave ▼		- 44:39:C4:29:82:CC
Data Buffering/Log	Total S - NPortIAW5150A-6VO - NPortIAW5150A-6VO_1 - - Port Settings Port Operation mode TCP alive check tim	■ IP ■ Serial No. tion Modes	- 192.168.126.254 - 1 1 Pair Connection Slave ▼ 7(0 - 99 min)		- 44:39:C4:29:82:CC
Data Buffering/Log	Total S - NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 - - - - - - - - - - - - -	■ IP ■ Serial No. tion Modes	- 192.168.126.254 - 1 1 Pair Connection Slave ▼ 7(0 - 99 min)		- 44:39:C4:29:82:CC

When **Operation Mode** is set to **Pair Connection Master** or **Pair Connection Slave** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Destination address** and **TCP port.** A Pair Connection application involves one serial port communicating over an IP network to another serial port as if the two serial ports were connected by a serial cable. Pair Connection modes can be used to extend RS-232 transmission to unlimited distances.

An NPort device server is needed at both ends of the connection. The serial port at one end must be set to Pair Connection Master mode, and the serial port at the other end must be set to Pair Connection Slave mode. It does not matter which serial port is master and which serial port is slave.

Default	7 min
Options	0 to 99 min
Description	<ul> <li>This field specifies how long the NPort will wait for a response to "keep alive" packets before closing the TCP connection. The NPort checks connection status by sending periodic "keep alive" packets.</li> <li>0: The TCP connection will remain open even if there is no response to the "keep alive" packets.</li> </ul>
	1 to 99: If the remote host does not respond to the packet within the specified time, the
	NPort will force the existing TCP connection to close.

#### TCP alive check time

#### **Destination address**

Default	
Options	IP address and port (e.g., "192.168.1.1" and "4001")

Description	This field specifies the IP address for the NPort at the opposite end of the Pair Connection,
	and the TCP port number for communication with the serial port. The port number must
	match with that serial port's TCP port setting.

#### TCP port

Default	4001
Options	
Description	This field specifies the TCP port to use for communication with the attached serial device.
	The serial port at the opposite end of the Pair Connection must use this port number to
	establish the connection.

## **Settings for Ethernet Modem Mode**

	Total Solution for Industrial Device Networking						
- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>					
Port Settings	tion Modes						
TCP port	e	1 Ethernet Modem ▼ 7 (0 - 99 min) 4001					
	- NPortJAW5150A-6I/O_1 - Port Settings Port Operation mode TCP alive check tim	- NPortIAW5150A-6I/O_1 Serial No	- NPortIAW5150A-6VO_1 Serial No1				

When **Application** is set to **Ethernet Modem Mode**, the NPort will accept AT commands such as "ATD 192.127.168.1:4001" from the serial port. A TCP connection will then be requested from the specified remote Ethernet Modem or PC. When the remote unit accepts this TCP connection, the NPort will return the "**CONNECT** {*baudrate*}" signal to the serial port and will then enter data mode. Please refer to Appendix C for details on Ethernet modem commands.

#### **TCP** alive check time

Default	7 min
Options	0 to 99 min
Description	This field specifies how long the NPort will wait for a response to "keep alive" packets
	before closing the TCP connection. The NPort checks connection status by sending periodic
	"keep alive" packets.
	0: The TCP connection will remain open even if there is no response to the "keep alive" packets.
	1 to 99: If the remote host does not respond to the packet within the specified time, the NPort will force the existing TCP connection to close.

#### TCP port

Default	4001
Options	
Description	This field specifies the TCP port to use for communication with the attached serial device.

## **Settings for Reverse Terminal Mode**

## **\*** Operation Modes

Port	1				
Operation mode	Reverse Terminal				
TCP alive check time	7 (0 - 99 min)				
Inactivity time	0 (0 - 99 min)				
TCP port	4001				
Terminal					
Authentication type	None v				
Map keys	CR-LF 🔻				

When Operation mode is set to Reverse Terminal Mode, you will be able to configure additional settings such as TCP alive check time, Inactivity time, and TCP port.

Default	7 min					
Options	0 to 99 min					
Description	This field specifies how long the NPort will wait for a response to "keep alive" packets					
	before closing the TCP connection. The NPort checks connection status by sending periodic					
	"keep alive" packets.					
	0: The TCP connection will remain open even if there is no response to the "keep alive" packets.					
	1 to 99: If the remote host does not respond to the packet within the specified time, the					
	NPort will force the existing TCP connection to close.					

#### **TCP** alive check time

#### **Inactivity time**

Default	0 ms
Options	0 to 65535 ms
Description	This field specifies the time limit for keeping the connection open if no data flows to or from the serial device.
	0: The connection will remain open even if data is never received. For many applications, the serial device may be idle for long periods of time, so 0 is an appropriate setting.
	1 to 65535: If there is no activity for the specified time, the connection will be closed. When adjusting this field, 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.

### TCP port

_	
Default	4001
Options	
Description	This field specifies the TCP port to use for communication with the attached serial device.

#### 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 User Table.
RADIUS	Verify the ID against the external RADIUS server.
None	Authentication is not required.

#### Map keys <CR-LF> (default=CR-LF)

This specifies how the ENTER key is mapped from the Ethernet port through the serial port.

Option	Description
<cr-lf></cr-lf>	carriage return + line feed (i.e., the cursor will jump to the next line, and return to the
	first character of the line)
<cr></cr>	carriage return (i.e., the cursor will return to the first character of the line)
<lf></lf>	line feed (i.e., the cursor will jump to the next line, but not move horizontally)

## **Communication Parameters**

<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150 - NPortIAW5150 -		<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126 - 1	- 192.168.126.254   MAC Address - 1  Firmware			- 44:39:C4:29:82:CC - 1.0 Build 16102410		
- Main Menu	* Modif		rial Paramet		ing connectio	ns.				
Overview	Port	Alias	Bard rate	Parity	Data bit	Stop bit	Flow control	FIFO	Interface	
Wizard Basic Settings	1		115200 ▼	None	▼ 8 ▼	1 🔻	RTS/CTS V	Enable 🔻	RS-232	1
- Network Settings				Submit						
- Serial Port Settings				Cabirrite						

The **Communication Parameters** page for each serial port is where serial communication settings are specified, such as **Baud rate**, **Data bits**, and **Stop bits**.

## Alias

Default	
Options	free text (e.g., "Secondary console connection")
Description	This is an optional free text field to help you differentiate one serial port from another. It
	does not affect operation of the NPort device server.



## ATTENTION

Serial communication settings should match the attached serial device. Check the communication settings in the user's manual for your serial device.

#### **Baud rate**

Default	115200			
Options	50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600,			
	115200, 230400, 460800, 921600, Other			
Description	This field specifies the baudrate for the serial port. Nonstandard baudrates are supported			
	through the "Other" setting. When set to "Other", you may manually enter a baudrate of			
	your choice, up to 921600.			
	50 to 921600: The serial port will operate at the specified baudrate			
	Other: The serial port will operate at a baudrate that is manually entered by the user.			

#### Parity

Default	None
Options	None, Odd, Even, Space, Mark
Description	This field specifies the type of parity bit used for each character frame.

#### Data bit

Default	8
Options	5, 6, 7, 8
Description	This field specifies the number of data bits used to encode each character of data.

#### Stop bit

Default	1
Options	1, 1.5, 2
Description	This field specifies the number of stop bits used for each character frame.

## **Flow control**

Default	RTS/CTS
Options	None, RTS/CTS, XON/XOFF, DTR/DSR
Description	This field specifies the type of flow control used by the serial port.

#### FIFO

Default	Enable		
Options	Enable, Disable		
Description	is field specifies whether the serial port will use the built-in FIFO. A 128-byte FIFO is		
	provided to each serial port for both Tx and Rx directions. To prevent data loss during		
	serial communication, this should be set to Disabled if the attached serial device does not		
	have a FIFO.		

## Interface

Default	RS-232
Options	RS-232, RS-422, RS-485 2-wire, RS-485 4-wire
Description	This field specifies the type of interface the serial port will use.

## Data Buffering/Log

MOXA	* Total Se	Total Solution for Industrial Device Networking			www.moxa.co
Name	- NPortlAW5150A-6I/O - NPortlAW5150A-6I/O_1 -	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	MAC Address Firmware	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	: Dat	ta Buffering	g/Log		
- Main Menu	Port		Port buffering (20M)	Serial c	lata logging (64K)
Overview	Port 1		Disable 🔻	Disable	¥
Wizard					
Basic Settings			Submit		
- Network Settings					
- Serial Port Settings					
Operation Modes					
Communication Paramet	ters				
Data Buffering/Log					

On the serial port's **Data Buffering/Log** page, you can enable or disable **Port buffering** and **Serial data logging**.

#### **Port buffering**

Default	Disable	
Options	Enable, Disable	
Description	his field specifies whether the serial port will use port buffering when the network	
	connection (Ethernet or WLAN) is down. Port buffering can be used in RealCOM mode, TCP	
	Server mode, TCP Client mode, and Pair Connection mode. For other modes, the port	
	buffering settings will have no effect.	

#### Serial data logging(64K)

Default	Disable	
Options	Enable, Disable	
Description	This field specifies whether data logs for the serial port will be stored on system RAM.	
	Each serial port is allotted 64 KB for data logging. The data log is not saved when the	
	NPort is powered off.	

# Web Console: IoT Management

With new firmware released, version 2.0 and later, the NPort IA5000A-I/O Series and NPort IAW5000A-I/O Series can configure cloud-relative settings. The following topics are covered in this chapter:

- Overview
- 🛛 IoT Mode
  - > Settings for Alibaba Cloud IoT Platform
  - > Settings for Azure IoT Hub
  - Settings for MQTT Broker
  - IoT Connection Monitoring
  - IoT Data Buffering

## **Overview**

This chapter explains how to configure all settings located under the IoT Management folder in the NPort web console.

# IoT Mode

Change the page to **IoT Management**  $\rightarrow$  **IoT Mode**, then **IoT mode** will show all the cloud platforms that the NPort device server support by default. There are Alibaba Cloud, Microsoft Azure and Generic MQTT.

Default	Disable
Options	Disable, Alibaba Cloud IoT Platform, Azure IoT Hub, MQTT Broker
Description Along with Application, this field specifies which cloud platform should connect to.	
	<b>Disable:</b> This serial port will be disabled without any function.
	Alibaba Cloud IoT Platform: This serial port will operate with the Alibaba
	Cloud.
	Azure IoT Hub: This serial port will operate with Microsoft Azure.
	MQTT Broker: This serial port will operate with a proprietary cloud.

## **Settings for Alibaba Cloud IoT Platform**

lain Menu	Basic Settings		
Overview	IoT platform	Alibaba Cloud IoT Platform V	
Wizard	Alibaba Cloud IoT Platform Settings		
Basic Settings	Server domain (Region)	Shanghai	
- Network Settings	Product key		
- IoT Management			
IoT Mode	Device name		
IoT Connection Monitoring	Device secret		
IoT Data Buffering	Keep alive	60 (60 - 180 sec.)	
- Serial Port Settings	Serial and I/O Message Format Settings		
- I/O Settings	Serial message format	JSON V	
- Remote I/O Access	Serial JSON message definition	Serial JSON	
- System Management			
- System Monitoring	I/O JSON message definition	I/O JSON	
- Restart	I/O publish trigger mode	Any I/O change • (Only DI and DO publish their	value changes)
geobead	Alibaba loT Publish		
WEBSERVER	Serial port 1	Topic /YourProductKey/YourDeviceName/update	QoS 1 V
	Serial port 2	Topic /YourProductKey/YourDeviceName/update	QoS 1 V
	I/O	Topic /YourProductKey/YourDeviceName/update	QoS 1 V
	Alibaba IoT Subscribe		
	Serial port 1	Topic /YourProductKey/YourDeviceName/get	QoS 1 V
	Serial port 2	Topic /YourProductKey/YourDeviceName/get	QoS 1 V
	1/0	Topic /YourProductKey/YourDeviceName/update	QoS 1 V

Basic Settings			
IoT mode	Alibaba Cloud IoT Platform		
Alibaba Cloud IoT Platfo	ibaba Cloud IoT Platform Settings		
Server domain (region)	Default is Shanghai.		
	There are 6 options: Shanghai, Singapore, Japan, America, Germany and User		
	Defined.		
	Select which server the NPort device server should connect to. If the server is		
	not listed, you may select User Defined to input the specific server address.		
Product key	Input the product key gave by Alibaba Cloud to establish the connection		
Device name	Give a unique name for the NPort device server for you to distinguish multiple		
	device servers		
Device secret	Input the secret (password) given by Alibaba Cloud to establish the connection		

Keep alive	By this time period, the NPort device	server will check if the Alibaba Cloud is					
	, , ,						
		seconds, and the longest period is 180					
	seconds.						
Serial and I/O Message							
Serial message format	Default is JSON.						
	There are 3 options: JASON, Raw with header, and Raw.						
	It defines the data format the NPort device server will upload to Alibaba Cloud. It accept three formats, JSON, Raw with header, and Raw. JSON is the default format the NPort device server will upload. Usually, the NPort may upload the different serial port's data to different topics						
						on the Alibaba Cloud. If the user sele	cts to upload them under the same topic,
						the user may select Raw with header	for the NPort to add some extra info at
						the header to distinguish different serial data from different serial ports. Serial Raw Data Definition	
		Raw Data Header (Big-endian)					
		Port 1 device ID	🕑 enable				
		Message number	enable				
		Data length	enable				
		o Alibaba Cloud. By clicking the button,					
	you may check the data format and n Serial JSON Message Definition						
	you may check the data format and n						
	you may check the data format and n Serial JSON Message Definition						
	you may check the data format and m  Sescrial JSON Message Definition  Publish JSON Message  ( "msgVer" : "1.0", "gwID" : "NPortIA5150A-121/0_5543",	nodify the details.					
	you may check the data format and m  Serial JSON Message Definition  Publish JSON Message  ( "msgVer" "1.0", "gwlD" " "NPortIA5150A-12J/0_5543", "devID" " SerialPort1", "dateTime" " "2018-08-27T15.43.14+08.00",	(devID is referred to Alias in Serial Port Settings - Communication Parameters)					
	you may check the data format and m  Serial JSON Message Definition  Publish JSON Message  (  'msgVer' : "1.0",  'gwID" : "NPortIA5150A-12//0_5543",  'devID" : "SenaiPort1",	(devID is referred to Alias in Serial Port Settings - Communication Parameters)					
	you may check the data format and m Secial JSON Message Definition Publish JSON Message ( "msgVer" : "1.0", "gwlD" : "NPortIA5150A-121/0_5543", "devID" : "serialPort1", "date Time" : "2018-08-27T15-43-14+08.00", "msgNumber" : 0-65535,	(devID is referred to Alias in Serial Port Settings - Communication Parameters)					
	you may check the data format and m Serial JSON Message Definition Publish JSON Message {     "msgVer" "1.0",     "gwlD" "NPortLA5150A-12//0_5543",     "devID" "SerialPort1",     "dateTime" "2018-08-27715 43:14+08.00",     "msgNumber" 0-65535,     "msgType" "Data",	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable					
	you may check the data format and m Secial JSON Message Definition Publish JSON Message {     "msgVer" :: "1.0",     "gwID" :: "NPortIA5150A-12/IO_5543",     "devID" :: "SerialPort1",     "dateTime" :: "2018-08-27115 43:14+08:00",     "msgType" :: "Data",     "msgType" :: "Data from serial port encoded into Base64 string" }	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
	you may check the data format and m Serial JSON Message Definition Publish JSON Message { "msgVer" "10", "gwUD" "NPortIA5150A-121/0_5643", "devID" "SerialPort1", "dateTime" "2018-08-27T15-43.14+08.00", "msgType" "04835, "msgType" "Data", "msgFrame" "Data from serial port encoded into Base64 string" } Subscribe JSON Message { [ "msgVer" "10",	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
	you may check the data format and m Secial JSON Message Definition Publish JSON Message  {     "msgVer" :: "1.0",     "gwID" :: "NPortIA5150A-12//0_5543",     "devID" :: "SeniaPort1",     "dateTime" :: "2018-08-27T15.43:14+08:00",     "msgType" :: "Data",     "msgFrame" :: "Data from serial port encoded into Base84 string" } Subscribe JSON Message {	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
	you may check the data format and m  Secial JSON Message Definition  Publish JSON Message  {     "msgVer" : "1.0",     "gwD" : "NPortIA5150A-121/0_5643",     "devID" : "serialPort1",     "dateTime" : "2018-08-27115-43.14+08.00",     "msgNumber" : 0-66535,     "msgType" : "Data",     "msgFrame" : "Data from serial port encoded into Base64 string"     Subscribe JSON Message  {     "msgVer" : "1.0",     "gwID" : "NPortIA5150A-121/0_5643",     "msgVer" : "1.0",     "gwID" : "NPortIA5150A-121/0_5643",     "	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
	you may check the data format and m  Secial JSON Message Definition  Publish JSON Message  {  msgVer" : "1.0",  "gwID" : "NPortIA5150A-12//0_5543",  "devID" : "2018-08-2711543:14+08:00",  "msgType" : "048:3,  "msgType" : "048:3,  "msgType" : "104;  Subscribe JSON Message  {  msgVer" : "1.0",  "msgVer" : "1.0",	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
	you may check the data format and m  Secial JSON Message Definition  Publish JSON Message  {  msgVer" : "1.0",  "gwID" : "NPortIA5150A-12//0_5543",  "devID" : "2018-08-2711543:14+08:00",  "msgType" : "048:3,  "msgType" : "048:3,  "msgType" : "104;  Subscribe JSON Message  {  msgVer" : "1.0",  "msgVer" : "1.0",	(devID is referred to Alias in Serial Port Settings - Communication Parameters) anable anable anable					
I/O JSON message	you may check the data format and m Secial JSON Message Definition Publish JSON Message {     "msgVer" :: "1.0",     "gwID" :: "NPortIA5150A-12//0_5543",     "deVID" :: "SenialPort1",     "dateTime" :: "2018-08-27T1543:14+08.00",     "msgType" :: "Data",     "msgTrame" :: "Data from serial port encoded into Base64 string" } Subscribe JSON Message {     [     "msgVer" :: "1.0",     "gwID" :: "NPortIA5150A-12//0_5543",     "deVID" :: "SenialPort1",     "msgVer" :: "1.0",     "gwID" :: "NPortIA5150A-12//0_5543",     "deVID" :: "SenialPort1",     "msgVer" :: "1.0",     "gwID" :: "NentIA5150A-12//0_5543",     "deVID" :: "SenialPort1",     "msgVer" :: "Data to serial port encoded into Base64 string" }	Incodify the details. (devID is referred to Alias in Serial Port Settings - Communication Parameters) ■ enable ■ enable ■ enable Base64 Encode/Decode for serial data					
I/O JSON message definition	you may check the data format and m  Secrial JSON Message Definition  Publish JSON Message  {     "msgVer" :: "1.0",     "gwID" :: "NPortL65150A-121/0_5543",     "devID" :: "SerialPort",     "dateTime" :: "2018-08-27114-08.00",     "msgVmber" :: 0-6555,     "msgType" :: 0-2655,     "msgType" :: 0-2655,     "msgType" :: 0-2655,     "msgType" :: 0-2645",     "msgVerme" :: "Data from serial port encoded into Base64 string" } Subscribe JSON Message  {     "msgVer" :: "1.0",     "gwID" :: "NPortL65150A-121/0_5543",     "devID" :: "SerialPort1",     "msgType" :: "Data to serial port encoded into Base64 string" }     Subscribe JSON Message  {     Time Type Type Type Type Type Type Type Typ	(devID is referred to Allas in Serial Port Settings - Communication Parameters)  e enable e enable e enable e enable Base64 EncoderDecode for serial data  Back data received by the NPort will be co Alibaba Cloud. By clicking the button,					

	•I/O J	SON	Message Defi	nition
	Publish JSON Message			
	{			
	"msgVer"	:	"1.0",	
	"gwID"	:	"NPortIA5150A-12I/O_55	43",
	"dateTime"	:	"2018-08-27T15:43:14+0	8:00", 🗌 enable
	"msgNumber"	:	0-65535,	enable
	"msgType"	:	"IO",	
	"DI00"	:	true/false,	✓ enable
	"DI01"	:	true/false,	✓ enable
	"DI02"	:	true/false,	enable
	"DI03"	-	true/false,	enable
	"DI04"	:	true/false,	enable
	"DI05"	:	true/false,	enable
	"DI06"	:	true/false,	enable
	"DI07"	:	true/false,	enable
	"DO00"	:	true/false,	enable
	"DO01"	:	true/false,	enable
	"DO02"	:	true/false, true/false.	enable
	"DO03" [user defined k	www.akual	uue/laise,	✓ enable
	"key1":"value1 "key2":"value2	n í í		enable
	"gwID" "msgType" "DO00" "DO01" "DO02"	:	"NPortIA5150A-12I/O_55 "IO", true/false, true/false, true/false,	-v ,
	"DO03"	:	true/false,	
	}			
				Submit Back
:/O publish trigger mode	<ul> <li>Default is Any I/O change.</li> <li>There are 3 options: Any I/O change, Specific I/O change and Cyclic</li> <li>It defines when the NPort device server should upload the I/O data to Alibaba</li> <li>Cloud. If the user wants to monitor more than one single I/O status, the user may select Any I/O change and then uncheck the I/Os that do not need to be monitored.</li> <li>Any I/O change: Where there is any changes of the I/O status.</li> <li>Specific I/O change: when Any specific I/O status has been changed, the specific data will be uploaded to Alibaba Cloud.</li> <li>Cyclic: Regularly updates the I/O status to Alibaba Cloud.</li> </ul>			
Alibaba IoT Publish	Cyclic: Regu	iany up		
erial port 1	clients can s server. If the Cloud (MQTT	ubscrib e data i F broker	e to this topic to rec s important, set the r) will respond with a	ud for the serial data of NPort, so oth eive the updates from the NPort devic QoS as 1, which means the Alibaba an ACK to the NPort to ensure it
				he Alibaba Cloud will not respond, whether the Alibaba Cloud received th

T/O	Cat the Dublish Tasis on the Alibete Cloud fourther I/O date as other alignets and
I/O	Set the Publish Topic on the Alibaba Cloud for the I/O data, so other clients can
	subscribe to this topic to receive updates from the NPort device server. If the
	data is important, set the QoS as 1, which means the Alibaba Cloud (MQTT
	broker) will respond with an ACK to the NPort to ensure it receives the
	message. When QoS is 0, the Alibaba Cloud will not respond with the ACK,
	which means the NPort does not whether the Alibaba Cloud received the data
	or not.
Alibaba IoT Subscribe	
Serial port 1	Set the Publish Topic on the Alibaba Cloud for the NPort to subscribe. The NPort
	will pass this data to the serial port. If the data is important, set the QoS as 1,
	which means the NPort will respond with an ACK to Alibaba Cloud to ensure it
	receives the message. When QoS is 0, the NPort will not respond with the ACK,
	which means the Alibaba Cloud does not know whether the NPort receives the
	data or not.
I/O	Set the Publish Topic on the Alibaba Cloud for the NPort to subscribe. The NPort
	will pass this data to the I/O. If the data is important, set the QoS as 1, which
	means the NPort will respond with an ACK to Alibaba Cloud to ensure it
	receives the message. When QoS is 0, the NPort will not respond with the ACK,
	which means the Alibaba Cloud does not know whether the NPort receives the
	data or not.

# **Settings for Azure IoT Hub**

	*IoT Mode	
Main Menu	Basic Settings	
Overview	IoT platform	Azure IoT Hub
Wizard	Azure IoT Hub Settings	
Basic Settings	-	
- Network Settings	Device connection string	HostName=tinghtit agure-devices net DeviceId+msPindDevice.SharetAcces
- IoT Management	Serial and I/O Message Format Settings	
IoT Mode	Serial and I/O message definition	Serial JSON I/O JSON
IoT Connection Monitoring	I/O publish trigger mode	Any I/O change (Only DI and DO publish their value changes)
IoT Data Buffering		
- Serial Port Settings		Submit
- I/O Settings		Outrint
- Remote I/O Access		
- System Management		
- System Monitoring		
- Restart		

Basic Settings				
IoT mode	Azure IoT Hub			
Azure IoT Hub Settings				
Device connection string	Input the "Device connection string" you get from the Microsoft Azure Cloud f			
	this specific NPort device server, then it will connect to the Azure cloud via the			
	string.			
Serial and I/O Message	Format Settings			
Serial and I/O message	It defines how the data format of the serial or DI/DO data received by the			
definition	NPort will be packed when the NPort uploads it to the Azure cloud. By clicking			
	the button, you may check the data format and modify the details.			

	-Serial J	Serial JSON Message Definition		
	Publish JSON Me	essage		
	{			
	"msgVer"		"1.0",	
	"gwID"		"NPortIA5150A-12I/O_5543",	
	"devID"		"SerialPort1",	(devID is referred to Alias in Serial Port Settings - Communication Parameters)
	"dateTime"		"2018-08-27T15:43:14+08:00",	enable
	"msgNumber"		0-65535,	enable
	"msgType"		"Data",	
	"msgFrame"		"Data from serial port encoded into Base64 string"	✓ enable Base64 Encode/Decode for serial data
	Subscribe JSON	Message	e	
	{			
	"msgVer"		"1.0",	
	"gwID"		"NPortIA5150A-12I/O_5543",	
	"devID"		"SerialPort1",	
	"msgType"		"Data",	
	"msgFrame"		"Data to serial port encoded into Base64 string"	
			Submit	Back
I/O publish trigger mode	Default is	s An	y I/O change.	
, - ,			,	Specific I/O change and Cyclic
				er should upload the I/O data to Alibaba
	Cloud. If	the	user wants to monitor me	ore than one single I/O status, the user
	may sele	ct A	ny I/O change and then ι	uncheck the I/Os that do not need to be
	monitore	d		
	Any I/O (	chan	ige: Where there is any cl	hanges of the I/O status.
	Specific I	:/O c	change: When Any specifi	ic I/O status has been changed, the
	specific d	lata	will be uploaded to Alibat	ba Cloud.
	Cyclic: R	egul	arly updates the I/O state	us to Alibaba Cloud.

# **Settings for MQTT Broker**

	•IoT Mode		
lain Menu	Basic Settings		
Overview	IoT platform	MQTT Broker	
Vizard	MQTT Connection Settings		
asic Settings	Host address		
letwork Settings			
T Management	Host port	1883	
IoT Mode	Username		
IoT Connection Monitoring	Password		
IoT Data Buffering	Client ID	Generate	
erial Port Settings	Keep alive	60 (1 - 65535 sec.)	
) Settings	Clean session	enable	
emote I/O Access	TLS (Transport Layer Security)		
rstem Management rstem Monitoring	TLS mode	Disable •	
estart	MQTT Will Message		
and and a later of the second s	Enable Will message	i enable	
goahead EBSERVER	Serial and I/O Message Format Settings		
	Message format	JSON Raw	
	Serial and I/O JSON message definition	Serial JSON I/O JSON	
	I/O publish trigger mode	Any I/O change   (Only DI and DO publish their value changes)	
	MQTT Publish		
	Serial port 1	Topic NPortIO/JSON/SPort1/Pub/Data QoS 1 ▼ Retain @	
	Serial port 2	Topic NPortIO/JSON/SPort2/Pub/Data QoS 1 • Retain @	
	1/0	Topic NPortIO/JSON/DIO/Pub QoS 1 • Retain 🖉	
	MQTT Subscribe		
	Serial port 1	Topic NPortIO/JSON/SPort1/Sub/Data QoS 1 •	
	Serial port 2	Topic NPortIC/JSON/SPort2/Sub/Data QoS 1 •	
	1/0	Topic NPortIO/JSON/DIO/Sub QoS 1 •	
	-		
	•	Submit	

Basic Settings					
IoT mode	MQTT Broker				
MQTT Broker Settings					
Host address	The web address (both domain nan	ne and IP address are acceptable) of the			
	•	NPort device server should connect to;			
	usually it's also where the MQTT br				
Host port	The TCP port used for this connection; default is 1883.				
Username	The username used for authenticati				
Password	The password used for authentication				
Client ID		for the broker to distinguish between			
	,	server will use the Client ID to establish the			
	connection.				
Keen alive		a conver will check if the cloud is still online			
Keep alive		ce server will check if the cloud is still online			
<u> </u>		and the longest period is 65535 seconds.			
Clean session	,,	the NPort device server is a subscriber.			
		Il clear the subscription information and			
	-	undelivered messages for the NPort while the NPort is offline. Default is			
	disabled.				
TLS (Transport Layer					
TLS mode	Default is Disable.				
	There are four options: Disable, TLS	S v1.0, TLS v1.1, and TLS v1.2.			
	It defines whether the NPort device	It defines whether the NPort device server uses a secured connection by TLS			
	between the cloud and the NPort. D	Default is Disabled.			
MQTT Will Message					
Enable Will message	Usually, this function is used when the NPort is a publisher. The publisher may				
	want to notify the subscribers when it's going offline. Enable it, then set the				
	message the NPort would like to inform the clients about.				
	MQTT Will Message				
	Enable Will message	✓ enable			
	Will topic Will QoS	NPortIO/MQTT/WillTopic			
	Will message	NPortIO unexpected exist			
	Will retain	enable			
Serial and I/O Messag	e Format Settings				
Message format	For generic MQTT, yhe NPort device	e server supports two methods to upload th			
	messages, JSON or Raw. Default is	JSON.			
Serial and I/O JSON	It defines how the data format of th	ne serial or DI/DO data received by the			
message definition	NPort will be packaged when the N	Port uploads it to the cloud platform. By			
		the data format and modify the details.			
	• Serial JSON Message Definition				
	Publish JSON Message				
	"msgVer" : "1.0",				
	"gwID" : "NPortIA5150A-12//O_5543",	(doub) is referred to Alias in Secial Part Sattings (Communication Parameters)			
	"devID" : "SerialPort1", "dateTime" : "2018-08-27T15:43:14+08:00",	(devID is referred to Alias in Serial Port Settings - Communication Parameters)			
	"msgNumber" : 0-65535, "msoTvpe" : "Data".	enable			
	"msgType" : "Data", "msgFrame" : "Data from serial port encoded into Base64 stri	ng" 🕑 enable Base64 Encode/Decode for serial data			
	}				
	Subscribe JSON Message {				
	"msgVer" : "1.0",				
	"gwID" : "NPortIA5150A-12I/O_5543", "devID" : "SerialPort1",				
	"msgType" : "Data",				
	"msgFrame" : "Data to serial port encoded into Base64 string" }				
	"msg-rame" : "Data to senal port encoded into Base64 string ) Subr				

	• I/O J	SON	Message Definitio	n	
	Publish JSON M	lessage			
	{ "msgVer"	:	"1.0",		
	"gwID"		"NPortIA5150A-12I/O_5543",		
	"dateTime"		"2018-08-27T15:43:14+08:00",	enable	
	"msgNumber"		0-65535,		
	"msgType"		"IO",		
	"DI00"	:	true/false,	✓ enable	
	"DI01"	:	, true/false,	✓ enable	
	"DI02"	:	, true/false,	✓ enable	
	"DI03"	:	true/false,	✓ enable	
	"DI04"	:	true/false,	✓ enable	
	"DI05"	:	true/false,	✓ enable	
	"D106"	:	true/false,	🕑 enable	
	"DI07"	:	true/false,	✓ enable	
	"DO00"	:	true/false,	🕑 enable	
	"DO01"	:	true/false,	✓ enable	
	"DO02"	:	true/false,	✓ enable	
	"DO03"	:	true/false,	✓ enable	
	[user defined ke "key1":"value1"	,		- anabia	
	"key2":"value2"			enable	
	}				
	Subscribe JSON	Message			
	"msgVer" "gwID"	:	"1.0", "NPortIA5150A-12I/O_5543",		
	"msgType"	:	"IO",		
	"DO00"	:	true/false,		
	"DO01"	:	true/false,		
	"DO02"	:	true/false,		
	"DO03"	:	true/false,		
	}				
				ubmit Back	
O publish trigger mode	Default is An				
	There are 3 options: Any I/O change, Specific I/O change and Cyclic				
	It defines when the NPort device server should upload the I/O data to Alibaba				
	Cloud. If the user wants to monitor more than one single I/O status, the user				
	may select Any I/O change and then uncheck the I/Os the user doesn't want to				
	monitor.				
	Any I/O change: Where there is any changes of the I/O status.				
	Specific I/O change: When Any specific I/O status has been changed, the				
	specific data will be uploaded to Alibaba Cloud.				
	Cyclic: Regul	arly up	dates the I/O status to Ali	ibaba Cloud.	
QTT Publish					
erial port 1	Set the Publish Topic on the Alibaba Cloud for the serial data of the NPort, so				
	other clients can subscribe to this topic to receive updates from the NPort				
	device server. If the data is important, set the QoS as 1, which means the				
	Cloud (MQTT broker) will respond with an ACK to the NPort to ensure it				
	receives the message. When QoS is 0, the cloud will not respond, which means				
	the NDert dev			eceived the data or not. If QoS is	

	2, the NPort will send another ACK back for the ACK replied by the Cloud for
	double confirmation.
	If the Retain function is enabled, the cloud will store the newest message from
	the publisher (the NPort) while the subscriber (the clients) is offline.
I/O	Set the Publish Topic on the Alibaba Cloud for the I/O data, so other clients can
	subscribe to this topic to receive updates from the NPort device server. If the
	data is important, set the QoS as 1, which means the cloud (MQTT broker) will
	respond with an ACK to the NPort to ensure it receives the message. When
	QoS is 0, the cloud will not respond with the ACK, which means the NPort does
	not know whether the Alibaba Cloud received the data or not. If QoS is 2, the
	NPort will send another ACK back for the ACK replied by the cloud for double
	confirmation.
	If the Retain function is enabled, the cloud will store the newest message from
	the publisher (the NPort) while the subscriber (the clients) is offline.
MQTT Subscribe	
Serial port 1	Set the Publish Topic on the Alibaba Cloud for the NPort to subscribe; the NPort
	will pass this data to the serial port. If the data is important, set the QoS as 1,
	which means the NPort will respond with an ACK to the cloud to ensure it
	receives the message. When QoS is 0, the NPort will not respond with the ACK,
	which means the xloud does not know whether the NPort received the data or
	not. If QoS is 2, the Cloud will send another ACK back for the ACK replied by
	the NPort for double confirmation.
I/O	Set the Publish Topic on the Alibaba Cloud for NPort to subscribe; the NPort will
	pass this data to the I/O. If the data is important, set the QoS as 1, which
	means the NPort will respond an ACK to Alibaba Cloud to ensure it receives the
	message. When QoS is 0, the NPort will not respond the ACK, which means the
	Alibaba Cloud does not know whether the NPort receives the data or not. If
	QoS is 2, the cloud will send another ACK back for the ACK replied by the NPort
	for double confirmation.

# **IoT Connection Monitoring**

lain Menu	Azure IoT Connection Information	
Overview	Target	linghub azure-devices net
Wizard	Connection status	Connected
Basic Settings - Network Settings	Diagnostics log	2019/03/28 11:23:27 Connecting 2019/03/28 11:23:32 Connected successfully!
- IoT Management		
IoT Mode		
IoT Connection Monitoring		
IoT Data Buffering		
- Serial Port Settings		Reset Log
- I/O Settings	Azure IoT Data Statistics	
- Remote I/O Access		
- System Management	Message meter size	4.0 (0.0 - 16.0 KB)
- System Monitoring	Auto clear data statistics	Disable 🔻 day of each month

Cloud Connection Inform	Cloud Connection Information				
Target	The URL of the remote cloud platform.				
Connection status	The status of the connection between the cloud platform and the NPort				
	device server.				
Diagnostics log	The log events recorded between NPort device server and the cloud				
	platform.				
	The events which will be recorded are listed as below:				
	1. The status of the connection:				
	Disconnected, Connecting, Connected successfully.				
	2. If the format of the received messages has a problem:				
	Received message was not valid JSON object, Received message had				
	duplicated msgNumber, Received message had invalid devID, received				
	message sent to serial failed.				
	3. If the serial data encode failed to be send to the cloud:				
	JSON encode failed because of a non-printable character in serial data,				
	JSON encode failed for the data prepared to send.				
	4. Others:				
	In Serial sniffer mode, C2D message (or subscribed message) was dropped,				
	set TLS error, please insert a SD card and restart NPort before enabling IoT				
	Data Buffering.				
Reset Log (button)	Click the button and the NPort will clear all the logs.				
<b>Cloud IoT Data Statistics</b>					
Unit size	The total packets were uploaded to the cloud.				
Auto clear data statistics	Default is Disable.				
	There are 32 options, including every day of a month and Disable.				
	It defines the frequency that the NPort should clear the data statistics.				

Data Statistics	D2C Message Number	Total D2C Data (KB)	C2D Message Number	Total C2D Data (KB)	Invalid C2D Message Numbe
Total	0	0	0	0	0
Serial Port 1	0	0	0	0	0
Serial Port 2	0	0	0	0	0
I/O	0	0 Re	0 eset Data Statistics	0	0
Exception	Statistics Numb	er of times			
Buffer overflow	v in SD card	0			

Reset Exception Statistics

Data Statistics	
Pub units (times of units)	The total packets uploaded to the cloud platform at the Total line. It only
	counts the packets passed from the serial port at the Serial Port line, and
	the I/O line is only for the I/O data.
Pub total data (KB)	Count the total packet bytes uploaded to the cloud platform at the Total
	line. Serial Port line is for serial data, and I/O line is for the I/O data.
Sub units (times of unit)	The total packets downloaded from the cloud platform at the Total line. It
	only counts the packets passed to the serial port at the Serial Port line, and
	the I/O line is only for the I/O data.
Subtotal data (KB)	Count the total packet bytes downloaded from the Cloud platform at the
	Total line. Serial Port line is for serial data, and I/O line is for the I/O data.
Invalid sub units (times of	If any of the downloaded packets have a problem, they will be counted in
unit)	this column.
Click the Reset Data Statistics	s button to restart the counts above.
Exception Statistics	
Buffer overflow in SD card	The exceptions will be counted in this sheet. There is only one exception at
	this moment: only when the SD card cannot store serial data any more.
Click the Reset Exception Sta	tistics button to restart the counts above.

# **IoT Data Buffering**

	• IoT Data Buffering	
in Menu	Connection Lost Data Settings	
Overview	Buffering on microSD card	Enable T
Wizard	Buffer size	2048 MB, can store 522240 messages at most. (128 - 2048 MB)
asic Settings	Buffer overflow	Overwrite the oldest V
Network Settings		
IoT Management	Cyclic sending intervals	50 (50 - 60000 ms), data update rate after connection recovere
IoT Mode		
IoT Connection Monitoring		Submit
IoT Data Buffering		
Serial Port Settings		
I/O Settings		
Remote I/O Access		
System Management		
System Monitoring		
- Restart		

IoT Data Buffering Setting	IS .
Buffering on microSD card	It defines when the connection with cloud platform is disconnected. If the
	NPort device server saves the coming serial data to the SD card, the default
	is Disable. Even if it is disabled, the coming data may save to internal
	memory (there are 20 MB for each NPort) first.
Buffer size	It defines how many bytes may be arranged on the SD card used for saving
	the offline data. Default is 2048 MB, which is also the maximum size. It can
	store 522240 messages at most " " if every packet is 4K.
Buffer overflow	Default is Overwrite the oldest.
	There are two options: Overwrite the oldest and Stop buffering.
	When the incoming data is more than the buffer size, what should the NPort
	do to handle the new coming data?
	Overwrite the oldest: If the newest data is the most important, select the
	option Overwrite the oldest, then NPort will always keep the newest
	incoming data and overwrite the oldest one.
	Stop buffering: If the oldest data is the most important, select the option
	Stop buffering, then the NPort will always keep the stored data and drop
	all the new comings.
Cyclic sending intervals	When the connection to the cloud platform comes back, what frequency
	should the NPort device server upload the data stored locally? The default
	time inverval is 300 ms; 60,000 ms is the maximum.

# 11

# Web Console: Modbus Address Mapping & I/O Setting

The following topics are covered in this chapter:

#### Modbus Address Mapping Table

- User-Defined Modbus Addressing
- Default Modbus Address

#### □ I/O Settings

- > DI Channels
- > DO Channels

# **Modbus Address Mapping Table**

# **User-Defined Modbus Addressing**

The NPort IA5000A-I/O and NPort IAW5000A-I/O Series play a role as the Modbus TCP slave and input and output addresses can be configured on this page. Select the **Enable User-defined Modbus Addressing** checkbox, and then configure the start address of each Modbus function. If you do not want to use the Modbus function, deselect the **Enable User-defined Modbus Addressing** checkbox.

ΜΟΧΛ°	Total Solution for Industrial Device Networking								www.moxa.o	
Model Name Location	- NPortIAW51 - NPortIAW51 -		ip Serial No.	- 192.168.126.254 - MOXA00000001			<ul> <li>MAC Addr</li> <li>Firmware</li> </ul>	ess	- 44:39:C4:29:8 - 1.0 Build 1612	
Main Menu		User-defined Modbus Address								
Overview	No.	Description	Start address (DEC)	Function Code		Read/Write	Reference a	ddress (DEC)	Total channels	Data type
Wizard	0	DO Value	0000	01:COIL STATUS	T	RW	00001		2	1 BIT
Basic Settings	1	DO Pulse Start/Stop	0016	01:COIL STATUS	•	RW	00017		2	1 BIT
- Network Settings	2	DO Value All Channel (Ch0-Ch1)	0032	03:HOLDING REGISTER	RV	RW	40033		1	1 WORD
- Serial Port Settings	3	DI Value	0000	02:INPUT STATUS		R	10001		4	1 BIT
- Modbus Address Mapping Table User-defined Modbus Address	4	DI Counter Value (Double Word)	0016	04:INPUT REGISTER	•	R	30017		4	2 WORD
Default Modbus Address	5	DI Value All Channel (Ch0-Ch3)	0048	04:INPUT REGISTER		R	30049		1	1 WORD
- I/O Settings	6	DI Counter Start/Stop	0256	01:COIL STATUS	T	RW	00257		4	1 BIT
- System Management	7	DI Counter Clear	0272	01:COIL STATUS	•	RW	00273		4	1 BIT
- System Monitoring										
- Restart			Subr	nit Load Default						

# **Default Modbus Address**

You can view the default Modbus address for all I/O devices on the **Default Modbus Address settings** page. However, only the starting address will be displayed for each item with multiple reference addresses. For example, if the reference addresses for DI Value start from 10001 and the second DI channel's reference address is 10002, only the first DI channel's Modbus address of 10001 will be displayed. See the diagram below.

ΜΟΧΛ	Total Solution for Industrial Device Networking						www.moxa.con		
	- NPortlAW5150A - NPortlAW5150A -			192.168.126.254 MOXA00000001			MAC Address Firmware	- 44:39:C4:29:82 - 1.0 Build 1612	
- Main Menu	No.	Defalut Modbus	Address Start address (DEC)	Function Code		Read/Write	Reference address (DB	C) Total channels	Data type
Overview	0	DO Value	0000	01:COIL STATUS	۲	RW	00001	2	1 BIT
Wizard	1	DO Pulse Start/Stop	0016	01:COIL STATUS	۲	RW	00017	2	1 BIT
Basic Settings	2	DO Value All Channel (Ch0-Ch1	0032	03:HOLDING REGISTER	R v	RW	40033	1	1 WORD
- Network Settings	3	DI Value	0000	02:INPUT STATUS	۲	R	10001	4	1 BIT
- Serial Port Settings	4	DI Counter Value (Double Word)	0016	04:INPUT REGISTER	۲	R	30017	4	2 WORD
- Modbus Address Mapping Table User-defined Modbus Address	5	DI Value All Channel (Ch0-Ch3)	0048	04:INPUT REGISTER	٠	R	30049	1	1 WORD
Default Modbus Address	6	DI Counter Start/Stop	0256	01:COIL STATUS	٠	RW	00257	4	1 BIT
- I/O Settings	7	DI Counter Clear	0272	01:COIL STATUS	•	RW	00273	4	1 BIT
- System Management - System Monitoring - Restart									En contractor

# I/O Settings

# **DI Channels**

The status of each DI (digital input) channel appears on the **DI Channel Settings** page.

ΜΟΧΛ	Total Solution for Industrial Device Networking				
	· NPortIAW5150A-6I/O · NPortIAW5150A-6I/O_1 ·	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
	:•DI	Channel Set	tings		
- Main Menu	DI Channel	mode	Status	Filter	Counter Trigger
Overview	DI-00	DI	OFF	12.5 ms	
Wizard	DI-01	DI	OFF	12.5 ms	
Basic Settings	DI-02	DI	OFF	12.5 ms	
- Network Settings	DI-03	DI	OFF	12.5 ms	
- Serial Port Settings					
- Modbus Address Mapping T	able				
- I/O Settings					
DI Channels					
DO Channels					

You can also configure each channel's digital input mode and parameters by clicking on the channel. DI channels can operate in **DI** mode or **Event Counter** mode.

### **DI Channel 0 Settings**

Γ	Mode	Filter	Counter Trigger	Counter Start/Enable
	1. Current Setting			
	DI T DI Counter	1		
	3. Save Counter On Po	wer Failure		

Activate **Event Counter** mode by selecting the **Counter Start** field and configure the **Counter Trigger** by selecting **Lo to Hi**, **Hi to Lo**, or **Both** from the drop-down menu. If the **Counter Start** field is not selected, you can still activate the counter by using Modbus commands.

# **DI Channel 0 Settings**

Mode	Filter	Counter Trigger	Counter Start/Enable
1. Current Setting			
Counter ▼ 2. Power On Setting	1	Lo to Hi ▼ Lo to Hi Hi to Lo	۷
		Both	
3. Save Counter On	Power Failure		
4. Reset Counter			
Apply to all			

**NOTE** Confirm that the Counter Filter is not set to 0; otherwise, the counter will never be activated.

**Power On Setting**: You may configure DI channels in **Event Counter** mode whether or not counting begins when powering up.

**Save Counter On Power Failure**: The NPort IA5000A-I/O and IAW5000A-I/O will automatically save the counter value when there is a power failure if this function is selected.

Reset Counter: Select this function to reset the counter.

You can apply the DI settings to all DI Channels by selecting the Apply to all DI Channels checkbox.

The DI channel's Alias Name and logic definition can also be configured on this page.

5. Alias Name							
Alias name of channel							
DI-00							
Alias name of "OFF" status							
OFF							
Alias name of "ON" status							
ON							
Submit Back							

#### **DI Channel Specifications**

Note1:	Filter unit=12.5ms, range=1~65535.
Note2:	
Sensor Type	-> Wet Contact and Dry Contact.
Dry Contact	-> OFF : Open.
	-> ON : Short to GND.
Wet Contact (Sink/NPN)	-> OFF : 10 - 30VDC.
	-> ON : 0-3 VDC.
Wet Contact (Source/PNP)	-> OFF: 0-3 VDC.
	-> ON : 10 - 30VDC.

WARNING: Be sure to Save/Restart your settings.

### **DO Channels**

On the **I/O Setting: DO (Digital Output) Channels** page; you can configure each DO channel by clicking on the channel.

ΜΟΧΛ	s Total S	Total Solution for Industrial Device Networking					
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410		
	: DO	Channel Se	ttings				
- Main Menu	DO Channel	mode	Status	ON Width	OFF Width		
Overview	DO-00	DO	OFF				
Wizard	DO-01	DO	OFF				
Basic Settings							
- Network Settings							
- Serial Port Settings							
- Modbus Address Mapping	Table						
- I/O Settings							
DI Channels							
DO Channels							

DO channels can operate in DO mode when the status is either ON or OFF.

# **DO Channel 0 Settings**

Mode	DO Status	ON Width*	OFF Width*	Pulse Count	Pulse Start
1. Current Setting					
DO 🔻	OFF 🔻				
2. Power On Setting	OFF				
z. Power on setting	ON				
	OFF V				

If you select **Pulse Output** mode, you can specify the **ON Width** and **OFF Width** to generate a square wave.

# **DO Channel 0 Settings**

Mode	DO Status	ON Width*	OFF Width*	Pulse Count	Pulse Start
1. Current Setting					
Pulse Output 🔻		1	1	0	

#### Pulse width unit = 25ms, range = 1-65535.

When configuring individual channels, if **Power On Setting** is selected, the pulse output will start as soon as the NPort is powered on. If the **Safe Status Setting** is selected, the pulse output will start only when the NPort has entered **Safe Status** mode. In contrast, when neither of these settings is selected and the **Pulse Start** field is selected, the NPort will automatically stop the pulse output when the NPort is either powered on or in **Safe Status** mode.

# **DO Channel 0 Settings**

Mode	DO Status	ON Width*	OFF Width*	Pulse Count	Pulse Start
1. Current Setting					
DO 🔻	OFF V				
2. Power On Setting					
	OFF V				
3. Safe Status Setting					
	HOLD LAST V				
Apply to all DO channe	els				
4. Alias Name					
Alias name of channel					
DO-00					
Alias name of "OFF" state	ıs				
OFF					
Alias name of "ON" statu	s				
ON					

**NOTE** Safe Status is controlled by the Communication Watchdog under Basic Settings, which is disabled by default. If the Communication Watchdog is disabled, the NPort will never enter Safe Mode and your Safe Status settings will have no effect.

The DO channel's Alias Name and logic definition can also be configured on this page. You can apply the DO settings to all channels by clicking on the **Apply to all DO channels** checkbox.

# Web Console: Remote I/O Access

The NPort IA(W)5000A-I/O integrates serial device servers with digital inputs and outputs for applications that need to connect serial devices to an Ethernet network and collect field data via DIO at the same time. The NPort has a built-in MTConnect Adapter/Agent, which users can select to retrieve DI data, besides using standard Modbus TCP. Besides MTConnect, it also has the ability to connect serial and I/O data to the cloud through generic MQTT and supports MQTT connectivity with built-in device SDKs to Azure/Alibaba Cloud. The following topics are covered in this chapter:

#### Access Interface

#### Modbus Address Mapping Table

- > User-Defined Modbus Address
- Default Modbus Address
- MTConnect in Brief
- MTConnect Devices and Data Types
  - > MTConnect Data Item Setting on the NPort
  - > MTConnect Event Setting on the NPort
  - > MTConnect Misc. Setting on the NPort
- Type of Requests Supported on the NPort-MTConnect Agent

# **Access Interface**

Change the page to **Remote I/O Access** → **Access Interface**; then select the way NPort device server should upload the data of DI Channels and DO Channels.

ΜΟΧΛ		Total Solution for Industrial I	Device Networking		www.moxa.com
= Model = Name = Location	- NPortIA5150A-121/O - NPortIA5150A-121/O_5543 -	■ IP ■ Serial No.	- 192.168.127.254 - TAHCB1015543	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 00:90:E8:6C:2A:3B - 2.0 Build 19022715
	Remote I/O Ac	cess Interface			
- Main Menu	DI Channels				
Overview	DI access interface		Web + Modbus address mapping	•	
Wizard	DO Channels				
Basic Settings	DO access interface		Web + Modbus address mapping		
- Network Settings	DO access interrace		web + Modbus address mapping		
- IoT Management		_	01.2		
- Serial Port Settings			Submit		
- I/O Settings					
- Remote I/O Access					
Access Interface					
- Modbus Address Mapping Table					
User-Defined Modbus Address					
Default Modbus Address					
- MTConnect Settings					
- System Management					
- System Monitoring					
- Restart					
goahead WEBSERVER					

#### **DI Channels**

Default	Web + Modbus address mapping
Options	Web + Modbus address mapping, MTConnect, IoT + Web + Modbus address
	mapping
Description	It defines when the user wants to get the status of the DI; user can get it
	from Web Console, Modbus protocol, MTConnect protocol or IoT Cloud
	platform.

#### **DO Channels**

Default	Web + Modbus address mapping
Description	It defines when the user wants to get the status of the DO; user can only
	set it via Web Console or Modbus protocol.

# **Modbus Address Mapping Table**

Change the page to **Remote I/O Access**  $\rightarrow$  **Modbus Address Mapping Table**, then configure the internal memory address of the DI/DO channels on the NPort device server to fulfill your SCADA system.

### **User-Defined Modbus Address**

ΜΟΧΛ	Total Solution for Industrial Device Networking						www.moxa.co	
Model Name Location	- NPortIA5150A-12I/O - NPortIA5150A-12I/O -	5543	<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.127.254 - TAHCB1015543		MAC Address     Firmware	- 00:90:E8:6C:2A - 2.0 Build 19022	
Main Menu		-Defined Modbus						
Overview	No. Des	cription	Start address (DEC)	Function code	Read/Write	Reference address (DEC)	Total channels	Data type
Wizard	0 DO	Value	0000	01:COIL STATUS ·	RW	00001	4	1 BIT
Basic Settings	1 DO	Pulse Start/Stop	0016	01:COIL STATUS +	RW	00017	4	1 BIT
- Network Settings	2 DO	Value All Channels (Ch0-Ch3)	0032	03:HOLDING REGISTER •	RW	40033	1	1 WORD
- IoT Management	3 DI V	alue	0000	02:INPUT STATUS *	R	10001	8	1 BIT
- Serial Port Settings	4 DIG	ounter Value (Double Word)	0016	04:INPUT REGISTER •	R	30017	8	2 WORD
- I/O Settings	5 DIV	alue All Channels (Ch0-Ch7)	0048	04:INPUT REGISTER ·	R	30049	1	1 WORD
- Remote I/O Access Access Interface		ounter Start/Stop	0256	01:COIL STATUS *	RIV	00257	8	1 BIT
Access Interface     Modbus Address Mapping Table		ounter Clear	0272	01:COIL STATUS *	RIV	00273	8	1 BIT
Modous Address Mapping Table     User-Defined Modbus Address		ounter orear						
Default Modbus Address			Sub	mit Load Default				
- MTConnect Settings			0.000					
- System Management								
- System Monitoring								
- Restart								
webserver								

Please check the checkbox of **Enable User-Defined Modbus Addressing** before you modify the supported function code and memory address of the DI/DO channels.

No.	The number of items a user can change.
Description	It defines the value of the DI/DO channels that can be user-defined on the
	start address and function code.
Start address (DEC)	The start address of each item which can be modified. It i showed with the
	decimal code.
Function code	The Modbus function codes that can be supported by an NPort device server
	for each item. Four function codes can be supported at most.
	01: Coil status
	02: Input status
	03: Holding register
	04: Input register
Read/Write	It defines if the memory is read only or it is read and writeable.
Reference address (DEC)	The start address of each item which can be modified. It is showed with
	decimal code.
Total channels	The total channels may be affected by the modification for each item.
Data type	The data type of each item; it may be changed by the function code user
	sets to be supported.

# **Default Modbus Address**

Model Name Location	- NPortIA51504 - NPortIA51504 -		<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.127.254 - TAHCB1015543		MAC Address Firmware	- 00:90:E8.6C:2A - 2.0 Build 19022	
	:- D	efault Modbus Ad	dress					
Main Menu	No.	Description	Start address (DEC)	Function code	Read/Write	Reference address (DEC)	Total channels	Data type
Overview	0	DO Value	0000	01.COIL STATUS V	RW	00001	4	1 BIT
Wizard	1	DO Pulse Start/Stop	0016	01:COIL STATUS ·	RW	00017	4	1 BIT
Basic Settings	2	DO Value All Channels (Ch0-Ch3)	0032	03:HOLDING REGISTER V	RW	40033	1	1 WORD
- Network Settings	3	DI Value	0000	02:INPUT STATUS *	R	10001	8	1 BIT
- IoT Management	4	DI Counter Value (Double Word)	0016	04:INPUT REGISTER •	R	30017	8	2 WORD
- Serial Port Settings	5	DI Value All Channels (Ch0-Ch7)	0048	04.INPUT REGISTER *	R	30049	1	1 WORD
- I/O Settings	6	DI Counter Start/Stop	0258	01:COIL STATUS *	RW	00257	8	1 BIT
- Remote I/O Access	7	DI Counter Clear	0272	01:COIL STATUS	RW	00273	8	1 BIT
Access Interface		bi odanici olcar	OL . L			000.00		1011
Modbus Address Mapping Table     User-Defined Modbus Address								
Default Modbus Address								
- MTConnect Settings								
- System Management								
- System Monitoring								
- Restart								

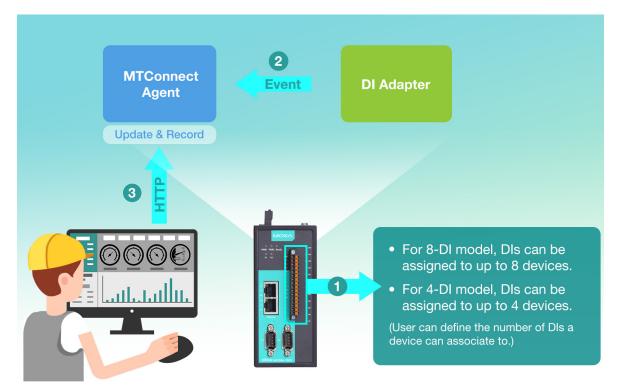
User may modify the Modbus address by his needs. Here represents the default settings for a reference.

# **MTConnect in Brief**

MTConnect is designed specifically for shop-floor applications that aim to define shop-floor data into a standard format that can be understood by any MTConnect-compliant software applications. Once the data has been defined by an MTConnect-compliant interface (name, type, description, etc.), it eliminates the need to redefine the data within each application.

For those legacy machine tools that do not support MTConnect, common practice is to get machine-related data through sensor connections and I/Os. Moxa NPort IA(W)5000A-I/O supports MTConnect-enabled capability for all digital inputs on the device and provides a configurable interface for users to define what data and appropriate MTConnect tags need to be tied to the digital inputs.

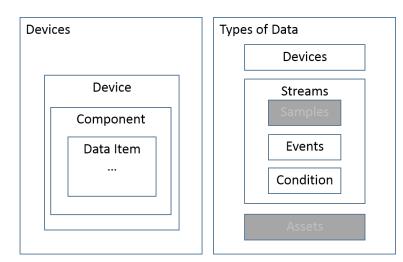
The NPort serves as an adapter as well as an agent to update and record MTConnect tags whenever an event happens. The client application is the requester and consumer of MTConnect data, of which the typical functions are to request, store, manipulate, and display data.



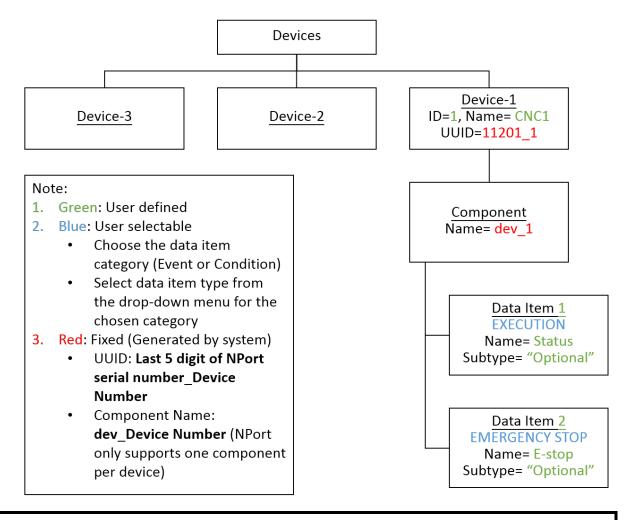
# **MTConnect Devices and Data Types**

An MTConnect "device" is a piece of equipment, such as a CNC machine or robot, organized as a set of components that provides data.

MTConnect defines the following types of data: devices, streams and assets. The NPort covers devices and streams but not assets. Within streams, the NPort covers all data items in events and conditions but not samples. (A sample is a continuous series of data points, and the NPort currently supports DI only when the acquisition of continuous data is not applicable at this point.)



For example, a device named CNC-1 is composed of a component: DigitalInput:dev\_1. The component then has the event or condition data item defined. In this example, the DigitalInput:dev\_1 component has the event data item: "Execution" and "EMERGENCY\_STOP".





# **MTConnect Data Item Setting on the NPort**

Access the NPort web console and go to **Data Item Settings** in the **MTConnect Setting** section. Define how many devices (or machines) you would like to connect with via digital inputs. Users will be able to map the digital inputs to the defined device(s) in the **Event Settings** page after all the data items are configured. Users may define up to eight devices for 8-DI model or four devices for 4-DI model.

Main Menu	Device	MTConnect Device ID	MTConnect Device Name
Overview	Device-1	1	CNC1
Wizard	Device-2	10	CNC10
Basic Settings	Device-3	NPortIA5150A-12IO_1201_3	NPortIA5150A-12IO_3
- Network Settings	Device-4	NPortIA5150A-12IO_1201_4	NPortIA5150A-12IO_4
	Device-5	NPortIA5150A-12IO_1201_5	NPortIA5150A-12IO_5
- Serial Port Settings	Device-6	NPortIA5150A-12IO_1201_6	NPortIA5150A-12IO_6
- Modbus Address Mapping Table	Device-7	NPortIA5150A-12IO_1201_7	NPortIA5150A-12IO_7
- I/O Settings	Device-8	NPortIA5150A-12IO_1201_8	NPortIA5150A-12IO_8
- MTConnect Settings			
Data Item Settings			
Event Settings			
Misc. Settings			
- System Management			
- System Monitoring			
- Restart			

Click on the device to configure **Data Item** settings.

Device Settings					
MTConnect Device ID		1			
MTConnect Device Nar	me	CNC1			
Data Item Settings		Submit			
Data Item Settings Data Item ID	Name	Submit	Subtype	Category	Current
	Name Status		Subtype	Category Event	Current

#### 1. Device Settings

**Device ID** and **Device Name** are user definable, but they are unique to the device and cannot be used for other devices on the NPort.

#### 2. Data Item Settings

Define data items that make up this device. Click **Add** to create a new data item that associates with this device or click on the existing data item and press **Edit** to change the setting.

# **MTConnect Data Item Editing**

Device-1 Data Item Attribute Settings

MTConnect Data Item ID	1
MTConnect Data Item Name	Status
MTConnect Data Item Category	Event <b>v</b>
MTConnect Data Item Type	EXECUTION <b>v</b>
MTConnect Data Item Subtype	
	Submit

- i. Data Item ID: Plain text
- ii. Data Item Name: Plain text
- iii. Data Item Category: Event or Condition
- iv. Data Item Type: This is defined by MTConnect standard, choose from drop-down menu
- v. Data Item Subtype: Plain text (optional field)

Click **Submit** after the configuration has been completed. The configured items will show up on the Device page.

### **MTConnect Event Setting on the NPort**

Let's use an example to explain the **Event Settings**. For example, let's say a stack light on a CNC has three colors. Table.1 below shows the behavior of the stack light and its represented status. Table.2 shows the physical digital input connections to the stack light.

	Stack Light
	Solid Green
	Flashing Gree
	Flashing Red
T	Green + Amb

Solid Green	Cycle
Flashing Green	Operator Call
Flashing Red	Alarm
Green + Amber	Conditional Stop
Tab	le. 1

Status

Input	Stack Light Connection
DI0	Green
DI1	Amber
DI2	Red

Table. 2

The DI adapter on the NPort is able to detect the status of the stack light and output user-defined MTConnect tags for client applications to retrieve.

If you wish to use the digital inputs on the NPort with MTConnect capability, make sure you check the box **Enable MTConnect Detection (Disable DI function)** on the **Event Settings** page. This means that you are going to configure the DI settings mainly on this page, and the setting of the **DI Channels** under the **I/O Settings** page will be disabled (configuration on the **I/O Setting** page is for Modbus TCP—not for MTConnect).

		_					0				
- Main Menu			nable MTC	onnect Detectio	on (Disable	DI function	)				
Overview	I							Triggered	Data		
Wizard	Info	ormation	Condition	1 🚺	2	and Cond	ition 2	Item	3	Triggered Value 4	
Basic Settings								Device	Data		
- Network Settings	No	In Use	Input	Mode	Period(s)	Input	Mode	Name	Item ID	Active Value	Inactive Value
- Serial Port Settings		-								[	
- Modbus Address Mapping Table	1		DI-00 V	On 🔻	1.0	N/A ▼	N/A ▼	CNC1 V	1 •	ACTIVE	READY
- I/O Settings	2		DI-00 ¥	Pulse On 🔻	1.0	N/A ▼	N/A ▼	CNC1 V	1 🔻	PROGRAM_COMLETED	READY
- MTConnect Settings	3		DI-02 ¥	Pulse On 🔻	1.0	N/A 🔻	N/A ▼	CNC1 V	1 🔻	FAULT	READY
Data Item Settings	4		DI-01 ¥	On 🔻	1.0	D1-00 V	On 🔻	CNC1 V	1 🔻	STOPPED	READY
Event Settings	-										
Misc. Settings	5		DI-00 ¥	On 🔻	1.0	N/A ▼	N/A ▼	N/A ▼	N/A ▼	act5	inact5
- System Management	6		DI-00 🔻	On 🔻	1.0	N/A 🔻	N/A 🔻	N/A ▼	N/A ▼	act6	inact6
- System Monitoring	7		DI-00 🔻	On 🔻	1.0	N/A 🔻	N/A ▼	N/A ▼	N/A 🔻	act7	inact7
- Restart	8		DI-00 ¥	On 🔻	1.0	N/A 🔻	N/A ▼	N/A ▼	N/A 🔻	act8	inact8

#### **MTConnect Event Settings**

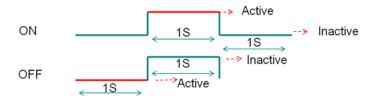
#### 1. Condition 1

Here you can configure what events you need the DI adapter to capture and generate the MTConnect tags you require.

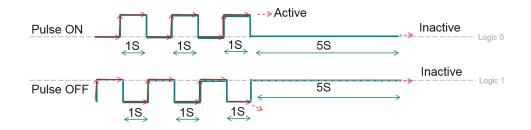
Input: Choose the DI number that you want to create for the MTConnect tag.

Mode/Period(s): Choose the DI State and period you recognize as Active.

• **DI On or Off:** The On/Off state will be recognized when the sampling length (Period) is reached. In this case, when in DI-ON mode, the Active tag is triggered when the On state lasts for one second.



**DI Pulse On/Pulse Off:** The Pulse On/Off state will be recognized when the sampling length (i.e., **Period** setting) is reached. In this case, when in Pulse-On mode, the Active tag is triggered when the Pulse-On state lasts for one second and happens within three cycles. (The Pulse cycles can be configured in **Misc. Settings**). The Inactive Tag will be triggered when the Off state lasts for five seconds. The duration of the Off state can be configured as well in **Misc. Settings**.



#### 2. AND Condition 2 (Optional)

Sometimes the event may happen in the conditional situation. In the case of the stack light example, when the green and amber lights are ON at the same time, the current machine status is **Conditional Stop**. In this kind of situation, users may use **AND Condition 2** to configure the dependent event.

Input: Choose the DI Number that you want to create for an AND event.

Mode: Choose the DI State that should be recognized in the AND event.

#### 3. Triggered Data Item

Configure the MTConnect tag attribute and the device that this tag belongs to.

**Device Name:** Choose from the drop-down menu. (The list will include the devices you have defined previously)

**Data Item ID:** Choose from the drop-down menu. (The data item IDs are the ones configured by users for the specified device)

#### 4. Triggered Value

These are Active/Inactive MTConnect tag values to be generated when the status of DI in Condition 1 (and Condition 2 if applicable) is detected.

Active Value: Plain text. (Triggered value when configured conditions occur.)

Inactive Value: Plain text. (Triggered value when configured conditions does not occur.)

Make sure the checkbox in the column In Use is checked if you want to activate the Event Settings.

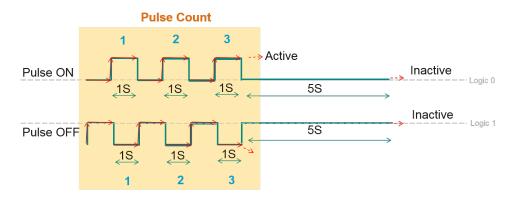
# **MTConnect Misc. Setting on the NPort**

Item		Pulse count	
Pulse On Active		3	
Pulse Off Active		3	
Pulse On Inactive		Off	5.0
Item		Mode	Period
Pulse Off Inactive		On	5.0
Fuise On mactive		011	5.0
	1		
ower-On Default Sta	ites		
ower-On Default Sta Device Name	Data Item ID	Status	
	La companya di secondari	Status AVAILABLE	
Device Name	Data Item ID		
N/A V	Data Item ID	AVAILABLE	

If users chooses **DI mode** to be **Pulse-On** or **Pulse-Off** in the **Event Settings** page, they will need to navigate to the **Misc. Settings** page to define pulse behavior.

#### 1. Pulse Mode Active Behavior Definition

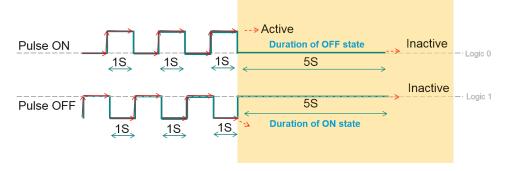
Depending on whether the user chooses **Pulse-On** or **Pulse-Off** as Active state, a **Pulse Count** value needs to be assigned.



#### 2. Pulse Mode Inactive Behavior Definition

Depending on whether the user chooses **Pulse-On** or **Pulse-Off** as Active state, the duration of the Off or On state needs to be assigned for **Inactive Behavior** recognition.

#### **Inactive Behavior**



#### 3. Power-On Default States

Based on the MTConnect standard, the initial state of all data items should be UNAVAILABLE, but in some circumstances where the user's client application may require the initial state of the data items to be AVAILABLE or in another state, the user can define his or her preferred power-on default states for the selected data items for specified devices.

# Type of Requests Supported on the NPort-MTConnect Agent

Currently, the MTConnect Agent on the NPort supports three main types of requests:

Probe request: Response describes the devices whose data is being reported.

Current request: Retrieves the values of the devices' data items when the request is received

Sample request: Retrieves a list of past and/or current values for one or more data item

MTConnect follows the rules of HTTP to fetch and transmit the requested MTConnect commands. The following are examples of the responses received for different commands.

**Probe command:** <u>http://IP of NPort:5000/probe</u>, as an example <u>http://192.168.127.254:5000/probe</u> gives the result as below:

```
v<MTConnectDevices xmlns:m="urn:mtconnect.org:MTConnectDevices:1.3"
xmlns="urn:mtconnect.org:MTConnectDevices:1.3" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:mtconnect.org:MTConnectDevices:1.3 /schemas/MTConnectDevices_1.3.xsd">
<kleader creationTime="2018-09-28T11:03:34Z" sender="MOXA" instanceId="I538130798"
version="1.3.0.17" assetBufferSize="1024" assetCount="0" bufferSize="16384"/>
v<Devices>
v<Device id="1" name="CNC1" sampleInterval="10" uuid="1201_1">
<Device id="1" name="CNC1" id="avail_1" type="AVAILABILITY"/>
<DataItems>
<DataItem category="EVENT" id="avail_1" type="EXECUTION"/>
<DataItems>
<DataItem category="EVENT" id="1" name="Status" type="EXECUTION"/>
<DataItem category="EVENT" id="2" name="E-stop" type="EMERGENCY_STOP"/>
</Device>
```

**Current command:** <u>http://IP of NPort:5000/current</u>, as an example <u>http://192.168.127.254:5000/current</u> gives the result as below:

#### Device: CNC1; UUID:1201\_1

#### Device:CNC1

Events

Timestamp	Туре	Sub Type	Name	Id	Sequence	Value
2018-09- 28T10:33:17.403803Z	Availability			avail_1	11	AVAILABLE

#### DigitalInput:di\_1

Events

Timestamp	Туре	Sub Type	Name	Id	Sequence	Value
2018-09- 28T10:33:17.403803Z	Execution		Status	1	9	AVAILABLE
2018-09- 28T10:33:17.403803Z	EmergencyStop		E-stop	2	10	AVAILABLE

**Sample command:** <u>http://IP of NPort:5000/sample</u>, as an example <u>http://192.168.127.254:5000/sample</u> gives the result as below:

Device: 0	CNC1;	UUID:1201_	1
-----------	-------	------------	---

#### Device:CNC1

Historical value

Timestamp	Туре	Sub Type	Name	Id	Sequence	Value
2018-09- 28T10:33:17.403803Z	Availability	Type		avail_1	1	UNAVAILABLE
2018-09- 28T10:33:17.403803Z	Availability			avail_1	11	AVAILABLE

#### DigitalInput:di\_1

Events

Timestamp	Туре	Sub Type	Name	Id	Sequence	Value
2018-09- 28T10:33:17.403803Z	Execution		Status	1	9	AVAILABLE
2018-09- 28T10:33:17.403803Z	EmergencyStop		E-stop	2	10	AVAILABLE

# Web Console: System Management

The following topics are covered in this chapter:

#### □ Overview

- **G** System Management
  - Misc. Network Settings
  - Auto Warning Settings
  - > Maintenance
  - > Certificate

# **Overview**

This chapter explains how to configure all settings located under the **System Management** folder in the NPort web console.

# System Management

# **Misc. Network Settings**

### **Accessible IP List**

ΜΟΧΛ	Total Solution for Industrial Device Networking							
	NPortIAW5150 NPortIAW5150		<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>			
	*	• Acc	essible IP L	ist				
Main Menu	En:	able the acces	sible IP list ( "Disable" wil	I allow all IP's connection req	uest.)			
Overview	No.	Active IP			Netmask			
Wizard								
Basic Settings	1							
- Network Settings	2							
- Serial Port Settings	3							
- Modbus Address Mapping T	able							
- I/O Settings	4							
- System Management	5							
- Misc. Network Settings	-							
Accessible IP List	6							
SNMP Agent	7							
User Table	8							
Authentication Server								
System Log Settings	9							
- Auto Warning Settings	10							
- Maintenance								
- Certificate	11							
- System Monitoring	12							
- Restart	<b>1</b> 3							

#### The Accessible IP List page is located under Misc. Network Settings in the System Management

folder. This page is used this restrict access to the NPort by IP address. Only IP addresses on the list will be allowed access to the NPort. You may add a specific address or range of addresses by using a combination of IP address and netmask, as follows:

#### To allow access to a specific IP address

Enter the IP address in the corresponding field; enter 255.255.255.255 for the netmask.

#### To allow access to hosts on a specific subnet

For both the IP address and netmask, use 0 for the last digit (e.g., "192.168.1.0" and "255.255.255.0").

#### To allow access to all IP addresses

Make sure that **Enable the accessible IP list** is not checked.

Refer to the following table for more configuration examples.

Desired IP Range	IP Address Field	Netmask Field
Any host	Disable	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

### **SNMP Agent Settings**

	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:3 - 1.0 E
	Configuration	MP Agent Se	ettings		
Main Menu Overview Wizard Basic Settings - Network Settings	SNMP Contact name Location Read communi	ty string	Enable		
- Serial Port Settings - Modbus Address Mapping T - I/O Settings - System Management	Read only user	rsion name	private V1, V2c, V3 ▼ rouser		
- Misc. Network Settings Accessible IP List SNMP Agent User Table	Read only authors Read only pass Read only priva	icy mode	Disable V Disable V		
Authentication Server System Log Settings - Auto Warning Settings	Read/write use	r name nentication mode	rwuser Disable ▼		
- Maintenance - Certificate - System Monitoring	Read/write priv Read/write priv		Disable <b>v</b>		

The **SNMP Agent** page is located under **Misc. Network Settings** in the **System Management** folder. This page is used to configure the SNMP Agent on the NPort.

#### SNMP

Default	Enable
Options	Enable, Disable
Description	This field enables or disables the SNMP Agent. If enabled, you will need to configure other
	SNMP Agent settings. You will need to enter a community name under Read community
	string.

#### **Contact Name**

Default	
Options	free text (e.g., "J Smith")
Description	This is an optional free text field that can be used to specify the SNMP emergency contact
	name, telephone, or pager number.

#### Location

Default	
Options	free text (e.g., "Building XYZ")
Description	This is an optional free text field that can be used to specify the location for SNMP agents
	such as the NPort.

#### **Read Community String**

Default	public
Options	free text (e.g., "public community")
Description	This field specifies the read community string used for the SNMP Agent. This is a text
	password mechanism that is used to weakly authenticate queries to agents of managed
	network devices.

#### Write Community String

Default	private
Options	free text (e.g., "private community")
Description	This field specifies the write community string used for the SNMP Agent. This is a text
	password mechanism that is used to weakly authenticate changes to agents of managed
	network devices.

#### **SNMP Agent Version**

Default	V1, V2c, V3
Options	V1, V2c, V3 / V1, V2c / V3 only
Description	This field specifies which version(s) of SNMP to support.

#### Read Only User Name

Default	rouser
Options	free text (e.g., "guest")
Description	This field specifies a user name to use for read only access.

#### **Read Only Authentication Mode**

Default	Disable
Options	Disable, MD5, SHA
Description	This field specifies the type of authentication to use for read-only access.

#### Read Only Password

Default	
Options	free text (e.g., "password123")
Description	This field specifies the password that users must enter for read-only access, if read only
	authentication is enabled.

#### **Read Only Privacy mode**

Default	Disable
Options	Disable, DES_CBC
Description	This field specifies whether DES_CBC data encryption will be used during read-only
	access.

#### **Read Only Privacy**

Default	
Options	free text (e.g., "read only key")
Description	This field specifies the encryption key for read-only access, if read-only privacy is enabled.

#### **Read/Write User Name**

Default	rwuser
Options	free text (e.g., "admin")
Description	This field specifies a user name to use for read/write access.

#### **Read/Write Authentication Mode**

Default	Disable
Options	Disable, MD5, SHA
Description	This field specifies the type of authentication to use for read/write access.

#### **Read/Write Password**

Default	
Options	free text (e.g., "password123")
Description	This field specifies the password that users must enter for read/write access, if read only
	authentication is enabled.

#### **Read/Write Privacy mode**

Default	Disable
Options	Disable, DES_CBC
Description	This field specifies whether DES_CBC data encryption will be used during read/write
	access.

#### **Read/Write Privacy**

Default	
Options	free text (e.g., "read write key")
Description	This field specifies the encryption key for read/write access, if read-/write privacy is enabled.

### **User Table**

MOXA		Total Solution for Industrial Device Networking						
<ul><li>Model</li><li>Name</li><li>Location</li></ul>		1AW5150A-1 1AW5150A-1		<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>		
	Â		• Use	r Table				
- Main Menu		No	User N	lame		Password		
Overview		1						
Wizard								
Basic Settings		2						
- Network Settings		3						
- Serial Port Settings		4						
- Modbus Address Mappin	g Table	7						
- I/O Settings		5						
- System Management		6						
- Misc. Network Setting	S							
Accessible IP List		7						
SNMP Agent	_	8						
User Table								
Authentication Serve	er	9						
System Log Settings	6	10						

The NPort User Table can be used to authenticate users for reverse terminal access and is useful if you do not have an external RADIUS server for authentication. The NPort User Table stores up to 64 entries, with fields for User Name and Password.

### **Authentication Server**

MOX	Total S	Total Solution for Industrial Device Networking				
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410	
	Î • Aut	thentication	Server			
- Main Menu	RADIUS					
Overview	RADIUS serve	F				
Wizard	RADIUS key					
Basic Settings	UDP port		1645 🔻			
- Network Settings		unting	Disable V			
- Serial Port Settings	RADIUS accou	unung	Disable ¥			
- Modbus Address Mappir	ng Table					
- I/O Settings			Submit			
- System Management						
- Misc. Network Setting	js					
Accessible IP List						
SNMP Agent						
User Table						
Authentication Serv	ver					
System Log Setting	IS					

RADIUS server: If you are using a RADIUS server for user authentication, enter its IP address here.
RADIUS key: If you are using a RADIUS server for user authentication, enter its password here.
UDP port (default=1645): If you are using a RADIUS server, enter its UDP port assignment here.
RADIUS accounting: Use this field to enable or disable RADIUS accounting.

### System Log Settings

ΜΟΧΛ						
	NPortIAW5150A-6I/O NPortIAW5150A-6I/O		<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - MOXA00000001	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16120718
	-	System	n Log Setti	ngs		
Main Menu	Event Group	Local Log	Summary			
Overview	System		System Cold Start,	System Warm Start		
Wizard Basic Settings	Network		DHCP/BOOTP Get Safe Mode Activate	IP/Renew, Mail Fail, NTP Connect	Fail, IP Conflict, Network Link Do	own, Modbus/TCP Disconnect,
- Network Settings - Serial Port Settings	Config		Login Fail, IP Char Wireless Certificate	iged, Password Changed, Firmwar Import, Serial Data Log Export	e Upgrade, SSL Certificate Impo	rt, Config Import, Config Expor
- Modbus Address Mapping Tal	OpMode		Connect, Disconne	ect, Restart		
- I/O Settings				Submit		
- System Management				Oubilite		
- Misc. Network Settings						
Accessible IP List						
SNMP Agent						
User Table						
Authentication Server System Log Settings						
- Auto Warning Settings - Maintenance						
- Certificate						
- System Monitoring						
- Restart						

The System Log page is located under Misc. Network Settings in the System Management folder.

This is where you select the type of events that will be logged by the NPor	t.
---	----

Group	Event
System	System Cold Start, System Warm Start
Network	DHCP/BOOTP Get IP/Renew, Mail Fail, NTP Connect Fail, IP Conflict, Network Link Down,
	Modbus/TCP Disconnect, Safe Mode Activated
Config	Login Fail, IP Changed, Password Changed, Firmware Upgrade, SSL Certificate Import,
	Config Import, Config Export, Wireless Certificate Import, Serial Data Log Export
Op Mode	Connect, Disconnect, Restart

# **Auto Warning Settings**

### **Event Settings**

MOX		Total Solution for Industrial Device Networking							
<ul><li>Model</li><li>Name</li><li>Location</li></ul>		v5150A-6I/O v5150A-6I/O_1	■ IP ■ Serial No.	- 192.1 - 1	68.126.254		MAC Address Firmware		
Main Menu		- C - (	E (						
Overview		Syst	em Event S	settings					
Wizard									
Basic Settings		System Event							
- Network Settings		Cold start		Mail 🗌	Trap 🗌				
- Serial Port Settings		Warm start		Mail 🗌	Trap 🗌				
- Modbus Address Ma	pping Table	Power Input 1 F	ailure	Mail 🗌		Relay output 🔲			
- I/O Settings		Power Input 2 F	ailure	Mail 🗌		Relay output			
- System Managemen	t	Ethernet Link D	own			Relay output			
- Misc. Network Se	ttings					Relay output			
- Auto Warning Set	tings	Config Event							
Event Settings		Console(web/te	xt) login auth fail	Mail 🗌	Trap 🗌				
Serial Event Se	ttings	IP changed		Mail 🗌					
I/O Event Settin	g	Password chan	ged	Mail 🗌					
E-mail Alert			-						
SNMP Trap				Subr	nit				
- Maintenance				J	int interest of the second sec				

#### The **Event Settings** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how the NPort will notify you of system and configuration events. Depending on the event, different options for notification are available, as shown above. **Mail** refers to sending an e-mail to a specified address. **Trap** refers to sending an SNMP trap.

Event	Description
Cold start	The NPort was powered on, or was restarted after a firmware upgrade.
Warm start	The NPort restarted without powering off.
Power Input 1 Failure	The NPort was not receiving power from PWR1. (The NPort device server has
	two DC power inputs for redundancy.)
Power Input 2 Failure	The NPort was not receiving power from PWR2. (The NPort device server has
	two DC power inputs for redundancy.)
Ethernet Link Down	The Ethernet connection has failed.
Console login auth fail	An attempt has been made to open the web, Telnet, or serial console, but
	the password was incorrect.
IP changed	The IP address has been changed.
Password changed	The password to the console has been changed.

### **Serial Event Settings**

ΜΟΧΛ	То	Total Solution for Industrial Device Networking					
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP I Serial No.			<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410	
- Main Menu	*						
Overview		Serial Event Se	ttings				
Wizard			1		1		
Basic Settings	Serial Port Eve	ent	DCD changed	l	DSR char	DSR changed	
- Network Settings	Port 1		Mail 🔲	Trap 🔲	Mail 🔲	Trap 🔲	
- Serial Port Settings							
- Modbus Address Mapping	g Table		Submit				
- I/O Settings							
- System Management							
- Misc. Network Settings	;						
- Auto Warning Settings							
Event Settings							
Serial Event Settings	5						

The **Serial Event Settings** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how the NPort will notify you of DCD and DSR events for each serial port. **Mail** refers to sending an e-mail to a specified address. **Trap** refers to sending an SNMP trap.

A change in the DCD (Data Carrier Detect) signal indicates that the modem connection status has changed. If the DCD signal changes to low, it indicates that the connection line is down. A change in the DSR (Data Set Ready) signal indicates that the data communication equipment is powered off. If the DSR signal changes to low, it indicates that the data communication equipment is powered down.



#### ATTENTION

SNMP indicates a change in DCD or DSR signals but does not differentiate between the two. A change in either signal from "-" to "+" is indicated by "link up" and a change in either signal from "+" to "-" is indicated by "link down."

# I/O Event Setting

ΜΟΧΛ	©	Total S	www.moxa.com			
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>		IAW5150A-6I/O IAW5150A-6I/O_1	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
- Main Menu	-		E ( C //'			
Overview		•1/O	Event Settin	ıg		
Wizard		DI channel	Mode	SNMP Trap	Trigger	
Basic Settings - Network Settings		DI-00	L		On Change	
- Serial Port Settings - Modbus Address Mapping	Tabla	DI-01	DI		On Change	
- I/O Settings	Table	DI-02	DI		On Change	
- System Management - Misc. Network Settings		DI-03	DI		On Change	
- Auto Warning Settings		DO channel	Mode	SNMP Trap	Trigger	
Event Settings		DO-00	DO		On Change	
Serial Event Settings I/O Event Setting	-1	DO-01	DO		On Change	
E-mail Alert						
SNMP Trap				Submit		

#### The IA5000A-I/O and IAW5000A-I/O Series provide the following private trap triggers:

Event	Description
DI-change status	Sends SNMP trap when DI status changes.
DO-change status	Sends SNMP trap when DO status changes.

\*SNMP Trap does not support Counter & Pulse Output function.

## E-mail Alert

MOX/	Total S	Total Solution for Industrial Device Networking			www.moxa.com
= Model = Name = Location	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
- Main Menu					
Overview	E-N	Iail Alert			
Wizard	la a su				
Basic Settings	Mail settings				
- Network Settings	Mail server (SM	MTP)			
- Serial Port Settings	My serve	r requires authentication	1		
- Modbus Address Mappi	ng Table User name				
- I/O Settings	Password				
- System Management	From e-mail ad	droce			
- Misc. Network Setting	gs				
- Auto Warning Setting	gs To e-mail addre	ess 1			
Event Settings	To e-mail addre	ess 2			
Serial Event Settin	gs To e-mail addre	ess 3			
I/O Event Setting	To e-mail addre	ess 4			
E-mail Alert					
SNMP Trap			Submit		
- Maintenance					

The **E-mail Alert** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how and where e-mail is sent when e-mail is used for automatic notification of system and serial port events.



#### ATTENTION

Consult your network administrator or ISP for the mail server settings to use for your network. If these settings are not configured correctly, e-mail notification may not work properly.

Mail Server (SMTP)		
Default		
Options	free text (e.g., "192.168.3.3")	
Description	This field specifies the IP address of the mail server that will be used when sending automatic warning e-mails. If the mail server requires authentication, select "My server requires authentication" and enter the username and password.	

#### From e-mail address

Default	
Options	free text (e.g., "jsmith@xyz.com")
Description	This field specifies the e-mail address that will be listed in the e-mail's "From" field.

#### To e-mail address 1 to 4

Default	
Options	free text (e.g., "admin@abc.com")
Description	These fields specify the destination e-mail address(es) for the automatic e-mail warnings.

#### **SNMP** Trap

MOX/	°.	Total Solution for Industrial Device Networking				www.moxa.com
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>		/5150A-61/O /5150A-61/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
- Main Menu			(D) (T)			
Overview		- SNN	AP Trap			
Wizard						
Basic Settings		SNMP Trap				
- Network Settings		SNMP trap serv	er IP or domain name			
- Serial Port Settings		Trap version		○ v2c ● v1		
- Modbus Address Mappir	ng Table	Trap community	,	0		
- I/O Settings		nup community	,			
- System Management				Submit		
- Misc. Network Setting	s			Submit		
- Auto Warning Setting	s					
Event Settings						
Serial Event Setting	IS					
I/O Event Setting						
E-mail Alert						
SNMP Trap						

The **SNMP Trap** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify the SNMP trap settings to use for automatic notification of system and serial port events.

#### **SNMP Trap Server IP**

Default	
Options	IP address (e.g., "192.168.5.5")
Description	This field specifies the IP address of the SNMP trap server that will receive SNMP traps.

#### **Trap Version**

Default	v1
Options	v1, v2c
Description	This field specifies the SNMP trap version to use.

#### **Trap Community**

Default	
Options	free text (e.g., "public access")
Description	This field specifies the SNMP trap community.

## Maintenance

### **Console Settings**

ΜΟΧΛ	Total Solution for Industrial Device Networking			
	NPortlAW5150A-6I/O NPortlAW5150A-6I/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
- Main Menu	A	1 0 111		
Overview	Con	sole Setting	S	
Wizard				
Basic Settings	Configurations	•		
- Network Settings	HTTP console		Enable 🔻	
- Serial Port Settings	HTTPS console		Enable 🔻	
- Modbus Address Mapping T	able Telnet console		Enable V	
- I/O Settings	SSH console		Enable V	
- System Management				
- Misc. Network Settings	Serial console		Enable 🔻	
- Auto Warning Settings	Reset button		Always enable	▼
- Maintenance Console Settings			Submit	
Ping				

The **Console Settings** page is located under **Maintenance** in the **System Management** folder. This is where you enable or disable access to the various NPort configuration consoles, as well as the behavior of the reset button. You may modify **HTTP console**, **HTTPS console**, **Telnet console**, **SSH console**, **Serial Console**, and **Reset button**.

#### **HTTP Console**

Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the HTTP (web) console.

#### **HTTPS Console**

Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the HTTPS (web) console.

#### **Telnet Console**

Default	Enable				
Options	Enable, Disable				
<b>Description</b> This field enables or disables access to the Telnet console.					

#### SSH Console

Default	Enable			
Options	Enable, Disable			
Description	This field enables or disables access to the SSH console.			

#### Serial Console

Default	Enable				
Options	ns Enable, Disable				
<b>Description</b> This field enables or disables access to the serial console.					

#### **Reset Button**

Default	Always Enable				
Options	Always Enable, Disable after 60 sec				
Description	This field specifies the behavior of the hardware reset button.				
	Always Enable: The reset button will be operate as usual.				
	Disable after 60 sec: The reset button will only be effective for the first 60 seconds that				
	the NPort is powered on.				

#### Ping

MOX		Total Solution for Industrial Device Networking				
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW - NPortIAW -	5150A-6I/O 5150A-6I/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	
Basic Settings	*	. Din	Tost			
- Network Settings		• F III	g Test			
- Serial Port Settings		Din a Da atin ati				
- Modbus Address Mappin	g Table	Ping Destinati	on			
- I/O Settings		Destination				
- System Management				<u>-</u>		
- Misc. Network Setting	s			Activate		
- Auto Warning Settings	6					
- Maintenance						
Console Settings						
Ping						
Firmware Upgrade						

The **Ping** page is located under **Maintenance** in the **System Management** folder. It provides a convenient way to test an Ethernet connection or verify an IP address. Enter the IP address or domain name in the Destination field and click **[Activate].** The results will be displayed immediately.

#### **Firmware Upgrade**

ΜΟΧΛ°	Tota	WWW.MO			
Model Name Location	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	∎ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
- Main Menu	• Firmware U	pgrade			
Overview Wizard Basic Settings - Network Settings - Seral Port Settings - Modbus Address Mapping Table - VIO Settings - JUS Settings - Misic Network Settings - Auto Warning Settings - Maintenance Console Settings - Ping Firmware Upgrade	Select firmware file	-	Note: Upgrade firmware will	discard your un-saved configuration cl	hanges and restart the syster

The **Firmware Upgrade** page is located under **Maintenance** in the **System Management** folder. This is where you can update the NPort firmware. After obtaining the latest firmware from www.moxa.com, select or browse for the firmware file in the **Select firmware file** field. Before clicking **[Submit]**, it is a good idea to save the NPort configuration using the **Configuration Export** page, since the firmware upgrade process may cause all settings to revert to factory defaults.

### **Pre-Shared Key**

^	• Pre-Shared Key
Main Menu	Cipher key for encrypting the configuration file
Overview	
Wizard	Submit
Basic Settings	
- Network Settings	
- Serial Port Settings	
- Modbus Address Mapping Table	
- I/O Settings	
- System Management	
- Misc. Network Settings	
- Auto Warning Settings	
- Maintenance	
Console Settings	
Ping	
Firmware Upgrade	
Pre-Shared Key	
Configuration Import	

The device server can share or back up its configuration by exporting all settings to a file, which can then be imported into another device server. The exported file will be encrypted by a pre-shared key by the user. (The default cipher key is **moxa**)

### **Configuration Import**

ΜΟΧΛ°	Total Solution for Industrial Device Networking					
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>		
^	:- Configuratio	n Import				
- Main Menu	Configuration Import					
Overview	Select configuration file			Browse		
Wizard	IP configuration		Import all configurations in	ncluding IP configurations.		
Basic Settings						
- Network Settings			Submit			
- Serial Port Settings			Submit			
- Modbus Address Mapping Table						
- I/O Settings						
- System Management						
- Misc. Network Settings						
- Auto Warning Settings						
- Maintenance						
Console Settings						
Ping						
Firmware Upgrade						
Configuration Import						
Configuration Export						

The **Configuration Import** page is located under **Maintenance** in the **System Management** folder. This is where you can load a previously saved or exported configuration. Select or browse for the configuration file in the **Select configuration file** field. If you also wish to import the IP configuration (i.e., IP address, netmask, and gateway), make sure that **Import all configurations including IP configurations** is checked.

## **Configuration Export**

мох	<b>A</b> °	Total So	olution for Indus		www.moxa.com	
		/5150A-61/O /5150A-61/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
Wizard	•		onfigurati	on Evnort		
Basic Settings			onfigurati	on Export		
- Network Settings		Configurat	tion Export			
- Serial Port Settings		Configura				
- Modbus Address Ma	pping Table					
- I/O Settings				Export		
- System Managemen	ıt					
- Misc. Network Se	ttings					
- Auto Warning Se	ttings					
- Maintenance						
Console Setting	gs					
Ping						
Firmware Upgr	ade					
Configuration I	mport					
Configuration E	Export					
Load Factory D	efault					

The **Configuration Export** page is located under **Maintenance** in the **System Management** folder. This is where you can save the NPort's current configuration to a file on the local host. Click **[Export]** to begin the process. A window should appear asking you to open or save the configuration text file.

## Load Factory Default

мох		Total Solution for	www.moxa.com		
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A- - NPortIAW5150A- -		- 192.168.126.25 No 1	i4 ■ MAC Addres: ■ Firmware	s - 44:39:C4:29:82:CC - 1.0 Build 16102410
Wizard Basic Settings	-	:• Load Fa	ctory Default		
<ul> <li>Network Settings</li> <li>Serial Port Settings</li> </ul>				le password, to the factory default nchanged, make sure that <b>Keep IF</b>	
- Modbus Address Ma	apping Table	Reset to Factory Default	t		
- I/O Settings		Keep IP settings			
- System Managemer	nt	C Reep in Settings			
- Misc. Network Se	ettings				
- Auto Warning Se	ettings		Submit		
- Maintenance					
Console Settin	igs				
Ping					
Firmware Upg	rade				
Configuration I	Import				
Configuration I	Export				
Load Factory D	Default				
Change Passv	vord				

The Load Factory Default page is located under Maintenance in the System Management folder. Click [Submit] to reset all settings to the factory defaults. You can preserve the NPort's existing IP settings (i.e., IP address, netmask, gateway, WLAN profile, and all certificates) by making sure Keep IP settings is checked before clicking [Submit].

## **Change Password**

MOX		Total So	olution for Indus	,	www.moxa.com		
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW51 - NPortIAW51 -		<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410	
Wizard Basic Settings	•	:• C	hange Pas	sword			
- Network Settings - Serial Port Settings		Password					
- Modbus Address M	apping Table	Account na	me	admin ▼ admin			
- I/O Settings		Old passwo	rd	user			
- System Manageme	nt	New passw	ord				
- Misc. Network S	ettings	Confirm pa	ssword				
- Auto Warning S	ettings						
- Maintenance				Submit			
Console Setti	ngs			Contract			
Ping							
Firmware Upg	rade						
Configuration	Import						
Configuration	Export						
Load Factory	Default						
Change Pass	word						
SD-Card Back	kup Setting 🖕						

The **Change Password** page is located under **Maintenance** in the **System Management** folder. To change the password, choose the account name first, and then enter the old password in the **Old password** field. Leave this blank if the NPort is not currently password-protected. Enter the new password twice, once in the **New password** field and once in the **Confirm password**. Leave these fields blank to remove password protection.



#### ATTENTION

If you forget the password, the ONLY way to configure the NPort is by loading the factory defaults with the reset button. All settings will be lost.

Before setting the password, you may want to first export the configuration to a file. Your configuration can then be easily imported back into the NPort if necessary.

## SD card Back-up Setting

The NPort IA5000A-I/O and IAW5000A-I/O Series are equipped with a microSD card slot for easy configuration. The microSD card can be used to store an NPort's system configuration settings.

MOX		Total Solution for Indu		www.moxa.com		
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortlAW5150A-6 - NPortlAW5150A-6 -		- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410	
- Serial Port Settings	· ·		1 0 44			
- Modbus Address M	lapping Table	• SD-card B	ackup Setting			
- I/O Settings						
- System Manageme	ent 🗆	Auto load SD-card's config	juration when system boots up		Activate	
- Misc. Network S	ettings					
- Auto Warning Se	ettings					
- Maintenance	5	Save the current configuration	on to SD-Card		Save	
Console Settir	ngs					
Ping	L. L.	Load the SD-card's configura	ation to NPort	_		
Firmware Upg	rade	Import all configurations in	ncluding IP configurations		Load	
Configuration			, comparatorio			
Configuration	Export					
Load Factory	Default					
Change Pass	word					
SD-Card Back	kup Setting					
- Certificate						

**Auto load SD card's configurations when system boots up**: By checking this option, the NPort will import the configuration file saved in the SD card to the NPort device when the system boots up. Click **[Activate]** to submit the change.

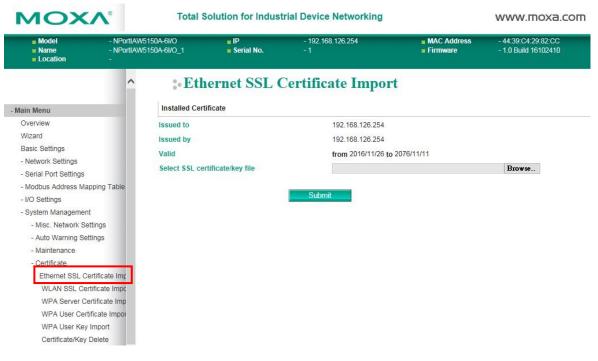
**Save the current configuration to SD card**: Users can manually save the current configuration to SD card by clicking **[Save]** button. This will overwrite the configuration file that was previously saved in the SD card if any.

Load the SD card's configuration to NPort: If a user does not want the configuration in SD card be loaded to the NPort device automatically upon system boot up, one can manually load the SD card's configuration to the NPort by clicking [Load] button. If you also wish to import the IP configuration (i.e., IP address, netmask, and gateway), make sure that **Import all configurations including IP** configurations is checked.

# Certificate

#### Ethernet SSL Certificate Import (for the NPort IAW5000A-I/O

#### Series)



The **Ethernet SSL Certificate Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the Ethernet SSL certificate. Select or browse for the certificate file in the **Select SSL certificate/key file** field.

## **SSL Certificate Import**

ain Menu	Installed Certificate				
Overview	Issued to	192.168.127.254			
Nizard	Issued by	192.168.127.254			
Basic Settings	Valid	from 2000/1/31 to 2060/1/16			
Network Settings			Brow		
Serial Port Settings	Select SSL certificate/key file		BIOW		
Modbus Address Mapping Table					
I/O Settings		Submit			
System Management					
- Misc. Network Settings					
- Auto Warning Settings					
- Maintenance					
- Certificate					
SSL Certificate Import					
Certificate/Key Deletion					

The **SSL Certificate Import** page is where you can load the SSL certificate for the HTTPS web console for use. Select or browse the certificate file in the **Select SSL certificate/key file** field

## WLAN SSL Certificate Import (for the NPort IAW5000A-I/O Series)

MOXA		Total S	www.moxa			
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5 - NPortIAW5 -		∎ IP ∎ Serial No.	- 192.168.126.254 - 1	MAC Address	- 44:39:C4:29:82:C0 - 1.0 Build 16102410
Basic Settings - Network Settings - Serial Port Settings	^	:• WL		ertificate Import		
<ul> <li>Modbus Address Mapping</li> <li>I/O Settings</li> <li>System Management</li> <li>Misc. Network Settings</li> </ul>	-	Issued to Issued by Valid		192.168.126.254 192.168.126.254 from 2016/11/27 to	2076/11/12	
Misc. Network Settings     Auto Warning Settings     Maintenance     Certificate     Ethernet SSL Certificat     WLAN SSL Certificat     WPA Server Certificat     WPA User Certificat	ate Imp te Impo ate Imp	Select SSL cer	tificate/key file	Submit		Browse

The **WLAN SSL Certificate Import** page is located under **Certificate** in the **System Management** folder. By default, the WLAN SSL certificate is automatically generated by the NPort based on the IP address of the wireless interface. You can also import a certificate. Select or browse for the certificate file in the **Select SSL certificate/key file** field.

## WPA Server Certificate Import (for the NPort IAW5000A-I/O Series)

MOX/	N°	Total Solution for Industrial Device Networking							
■ Model ■ Name ■ Location	- NPortIAW515 - NPortIAW515 -		<b>IP</b> Serial No.	- 192.168.126.254 - 1	MAC Address	- 44:39:C4:29:82:CC - 1.0 Build 16102410			
Basic Settings - Network Settings - Serial Port Settings	^	s• WP		ertificate Impor	t				
<ul> <li>Modbus Address Mappi</li> <li>I/O Settings</li> <li>System Management</li> <li>Misc. Network Settin</li> </ul>		Issued to Issued by Valid		Not installed Not installed <b>from</b> Not installed	to Not installed				
- Auto Warning Setting - Maintenance		Select WPA se	rver certificate file			Browse			
- Certificate Ethernet SSL Certifi WLAN SSL Certific WPA Server Certifi WPA User Certific WPA User Key Im Certificate/Key Del	cate Impo icate Imp ate Impoi port			Submit					

The **WPA Server Certificate Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the WPA server certificate. Select or browse for the certificate file in the **Select WPA server certificate file** field.

You must install the trusted server certificate from the RADIUS server in order to enable **Verify server certificate** in the WLAN **Security** settings. This certificate will then be used by the NPort to authenticate the RADIUS server.

## WPA User Certificate Import (for the NPort IAW5000A-I/O Series)

MOX	∧° Total \$	Total Solution for Industrial Device Networking					
Model Name Location	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	∎ IP ■ Serial No.	- 192.168.126.254 - 1	MAC Address Firmware	- 44:39:C4:29:82:CC - 1.0 Build 16102410		
Main Menu     Overview     Wizard     Basic Settings     - Network Settings     - Serial Port Settings     - Wodbus Address Mapp     - VO Settings     - System Management     - Misc. Network Setti     - Auto Warning Settir	Installed Cer Issued to Issued by Valid Select WPA u		tificate Import Not installed Not installed from Not installed t Submit	o Not installed	Browse		
- Maintenance - Certificate Ethernet SSL Certi WLAN SSL Certifi WPA Server Certifi WPA User Certifi WPA User Key In	ficate Impo cate Impo						

The **WPA User Certificate Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the WPA user certificate. Select or browse for the certificate file in the **Select WPA user certificate file** field.

The user certificate of the NPort must be installed in the RADIUS server when the NPort uses WPA (WPA2)/TLS. The trusted server certificate of the RADIUS server must also be installed in the NPort.

## WPA User Key Import (for the NPort IAW5000A-I/O Series)

ΜΟΧΛ	Total S	Total Solution for Industrial Device Networking						
	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	MAC Address	- 44:39:C4:29:82:CC - 1.0 Build 16102410			
	^ :• WP	A User Key	<b>Import</b>					
Main Menu	Installed Certi	ificate						
Overview	Key length		Not install!!					
Wizard		tificate/key file			Browse			
Basic Settings	Password for	to the second second						
- Network Settings	Password for p	Drivate Key						
- Serial Port Settings								
- Modbus Address Mapping Ta	ible		Submit					
- I/O Settings								
- System Management								
- Misc. Network Settings								
- Auto Warning Settings								
- Maintenance								
- Certificate								
Ethernet SSL Certificate	Imp							
WLAN SSL Certificate I	mpc							
WPA Server Certificate	Imp							
WPA User Certificate In	וסמר							
WPA User Key Import								
Certificate/Key Delete								

The **WPA User Key Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the WPA user certificate. Select or browse for the user private key file in the **Select WPA user privacy key file** field and enter the **Password for the private key**.

The user private key of the NPort must be installed in the RADIUS server when the NPort uses WPA(WPA2)//TLS. The trusted server certificate of RADIUS server must also be installed on the NPort.

## **Certificate/Key Delete**

	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>
	^ • Ce	rtificate/Key	Delete	
Main Menu	Installed Cer	tificate		
Overview	SSL certificat	e	🔿 Delete 💿 Keep	
Wizard	WPA server c	ertificate	No certificate installed	di
Basic Settings	WPA user cer	tificate/private key	No certificate/private	key installed
- Network Settings	The doct of	uncutoprivate key	No continenterprivate	key motaned:
- Serial Port Settings			Submit	
- Modbus Address Mapping 1	Table		Submit	
- I/O Settings				
- System Management				
- Misc. Network Settings				
- Auto Warning Settings				
- Maintenance				
- Certificate				
Ethernet SSL Certificat	e Imp			
WLAN SSL Certificate	Impc			
WPA Server Certificate	e Imp			
WPA User Certificate	Impor			

The **Certificate/Key Delete** page is located under **Certificate** in the **System Management** folder. This page is where you can delete certificates or WPA keys that have been installed on the model. When you click **[Submit]**, any certificate or key that has been set to "Delete" will be deleted from the NPort.

# 14

# Web Console: System Monitoring

The following topics are covered in this chapter:

- Overview
- System Monitoring
  - > Serial Status
  - System Status

# **Overview**

This chapter explains how to use the **System Monitoring** functions on the NPort web console. These functions allow you to monitor many different aspects of operation.

# **System Monitoring**

# **Serial Status**

## **Serial to Network Connections**

мох	<b>∧</b> °	Total Solution for Industrial Device Networking								www.moxa.com		
<ul><li>Model</li><li>Name</li><li>Location</li></ul>	- NPortIAW51 - NPortIAW51 -		■ IP ■ Serial No.	- 192.168.126.254  MAC Address - 1 Firmware			- 44:39:C4:29:82:CC - 1.0 Build 16102410					
	A	• Ser	rial to Netwo	ork C	Connec	tions						
- Main Menu		🕑 Auto refre	sh									
Overview		Port OP Mode					Conne	ections				
Wizard		1	Real COM	[	1	]	1	[	1	]	]	
Basic Settings		1	Real COM		1	I	1	I	1	]	]	
- Network Settings												
- Serial Port Settings												
- Modbus Address Ma	pping Table											
- I/O Settings												
- System Managemen	t											
- System Monitoring												
- Serial Status												
Serial to Networ	k Connectic											
Serial Port State	us											
Serial Port Erro	r Count											
Serial Port Setti	ings											

The **Serial to Network Connections** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can monitor the current operation mode and host connection status for each serial port.

## **Serial Port Status**

	NPortlAW515 NPortlAW515		■ IP ■ Serial N		02.168.126.254		C Addres mware		- 44:39:C4 - 1.0 Build		
Main Menu	*	Se Se	e <mark>rial Port</mark>	Status							
Overview		Port	TxCnt	RxCnt	TxTotalCnt	RxTotalCnt	DSR	DTR	RTS	CTS	DCI
Wizard		1	0	0	0	0	•	•	•	•	
Basic Settings											
- Network Settings											
- Serial Port Settings											
- Modbus Address Mapping T	able										
- I/O Settings											
- System Management											
- System Monitoring											
- Serial Status											
Serial to Network Conn											

The **Serial Port Status** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can monitor the signal and data transmission status for each serial port.

TxCnt: number of Tx packets (to device) for the current connection

RxCnt: number of Rx packets (from device) for the current connection

TxTotalCnt: number of Tx packets since the NPort was powered on

RxTotalCnt: number of Rx packets since the NPort was powered on

#### **Serial Port Error Count**

MOX		Total Solution for Industrial Device Networking					www.moxa.com		
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortlAW5 - NPortlAW5 -	150A-61/O 150A-61/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1		<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29: - 1.0 Build 161		
	<u>*</u>	• Seri	al Port Err	or Count					
- Main Menu		🖌 Auto refresh							
Overview					ErrCn	t			
Wizard		Port	Frame	Parity		Overrun	В	reak	
Basic Settings		1		0	0		0		
- Network Settings									
- Serial Port Settings									
- Modbus Address Ma	pping Table								
- I/O Settings									
- System Managemen	t								
- System Monitoring									
- Serial Status									
Serial to Netwo	rk Connectic								
Serial Port Stat	us								
Serial Port Erro	r Count								
Serial Port Sett									

The **Serial Port Error Count** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can view the current number of frame, parity, overrun and break errors for each serial port.

## **Serial Port Settings**

<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-( - NPortIAW5150A-( -		-	IP Serial No.	- 192.168 - 1	.126.254		MAC Ad Firmwar		44:39:C4:29:82:CC 1.0 Build 16102410
	<b>A</b>	S	erial I	Port Set	tings					
Main Menu	Ø	Auto re	efresh							
Overview							Flow	Control		
Wizard	P	ort I	Baud Rate	Data Bits	Stop Bits	Parity	RTS/CTS	XON/XOFF	FIFO	Interface
Basic Settings		1 115	5200	8	1	None	ON	OFF	Enable	RS-232
- Network Settings										
- Serial Port Settings										
- Modbus Address Map	ping Table									
- I/O Settings										
- System Management										
- System Monitoring										
- Serial Status										
Serial to Network	Connectic									
Serial Port Statu	S									
	Count									

The **Serial Port Settings** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can view the current communication settings for each serial port.

# **System Status**

## **Network Connections**

ΜΟΧΛ	D	То	tal Solut	ion for Indu	strial Device Networking		www.moxa.cor
		iaw5150a-6i/o iaw5150a-6i/o_	1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
Main Menu	-			1.0			
Overview			Netwo	ork Con	nections		
Wizard							
Basic Settings		Auto refresh	Recv-Q	Send-Q	Local Address	Foreign Address	State
- Network Settings			TIGGY-GR	Jend-Q			
- Serial Port Settings		TCP	0	0	*:4900	*:0	LISTEN
- Modbus Address Mapping 1	Table	TCP	0	0	*:966	*:0	LISTEN
- I/O Settings							
- System Management		TCP	0	0	*:80	*:0	LISTEN
- System Monitoring		TCP	0	0	*:502	*:0	LISTEN
- Serial Status		TCP	0	0	*:950	*:0	LISTEN
- System Status			-	-			
Network Connections		TCP	0	0	*:22	*:0	LISTEN
Serial Data Log		TCP	0	0	*:23	*:0	LISTEN
Relay Output Status		тср		0	*:443	*:0	LISTEN
System Log		TCP	0	0	1:443	^:0	LISTEN
WLAN Log		TCP	0	1275	192.168.126.254:80	192.168.126.55:51171	ESTABLISHED
WLAN Status		UDP	0	0	127.0.0.1:9877	*:0	
I/O Status			-	-			
- Restart		UDP	0	0	*:161	*:0	
goahead WEB <mark>SERVER</mark>		UDP	0	0	*:4800	*:0	

The **Network Connections** page is located under **System Status** in the **System Monitoring** folder. On this page, you can view the current status of any network connection to the NPort.

## Serial Data Log

Data logs for each serial port can be viewed in ASCII or HEX format. After selecting the serial port and format, you may click **Select** all to select the entire log if you wish to copy and paste the contents into a text file. The **Clear log** and **Refresh** buttons allow you to clear or refresh the log contents.

- Main Menu Overview Wizard Basic Settings - Network Settings - Serial Port Settings - Modbus Address Mapping Table - I/O Settings			Port1 •	
Wizard Basic Settings - Network Settings - Serial Port Settings - Modbus Address Mapping Table	Download Serial port	ial Data Log	Port1 V	
Basic Settings - Network Settings - Serial Port Settings - Modbus Address Mapping Table	Serial port			
- Network Settings - Serial Port Settings - Modbus Address Mapping Table	Serial port			
- Serial Port Settings - Modbus Address Mapping Table		at		
- Modbus Address Mapping Table	Download form	at		EX
				IEX
- I/O Settings			0 0	
			Clear log Dov	vnload
- System Management				moad
- System Monitoring				
- Serial Status				
- System Status				
Network Connections				

The **Serial Data Log** page is located under **System Status** in the **System Monitoring** folder. This is where you can download the current data log for a serial port. Select the desired serial port in the **Select** 

**port** field. Select the desired data format in the **Download format** field. Click **[Clear log]** to clear the log contents.

The data log includes all data sent or received by the specified serial port since the NPort was powered on. The maximum size of the log is 64 KB.

#### **System Alert Status**

The **System Alert Status** page is located under **System Status** in the **System Monitoring** folder. This is where you can check which event triggered the warning.

#### **Relay Output Status**

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.

#### Modbus/TCP Connection Watchdog Status

If the **Communication Watchdog Timeout** function is enabled (Please refer to Chapter 2: "Basic Settings"), the NPort will enter **Safe Mode** when a specified period of time has passed and there is a loss of Modbus/TCP network connectivity. The user may see the host connection status in the **System Alert** section under **System Monitoring** and clear the alert when the host connection resumes.

ΜΟΧΛ°		Total S	Total Solution for Industrial Device Networking				
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW - NPortIAW -	5150A-61/O 5150A-61/O_1	■ IP ■ Serial No.	- 192.168.126.254 - MOXA00000001	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16120718	
- Main Menu							
Overview		Syste	em Alert Sta	tus			
Wizard							
Basic Settings		Auto refresh					
- Network Settings		Relay Output Sta	atus				
- Serial Port Settings		Power input 1 fa	ilure	N/A		Acknowledge Event	
- Modbus Address Mapping	Table	Power input 2 fa		N/A		Acknowledge Event	
- I/O Settings		Fower input z la	nure	NA		Acknowledge Event	
- System Management							
- System Monitoring		Modbus/TCP Co	nnection Watchdog Stat	us			
- Serial Status		Host Connection	n Lost	N/A		Clear	
- System Status							
Network Connection	s						
Serial Data Log							
System Alert Status							
System Log	-						

#### System Log

MOX	<b>∧</b> °	Total S	olution for Indust	rial Device Networking		www.m
= Model = Name = Location	- NPortIAWS - NPortIAWS -	5150A-61/O 5150A-61/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:2 - 1.0 Build 16
	<b>A</b>	• Sys	tem Log			
- Main Menu		System Log				
Overview						
Wizard						
Basic Settings						
- Network Settings						
- Serial Port Settings						
- Modbus Address Map	ping Table					
- I/O Settings						
- System Management						
- System Monitoring						
- Serial Status						
- System Status						
Network Connec	tions					
Serial Data Log						
Relay Output Sta	tus					
System Log				Clear log Refre	esh	
WLAN Log						
WLAN Status						

The **System Log** page is located under **System Status** in the **System Monitoring** folder. This is where you can view the log of NPort system events. Click **[Clear log]** to clear the log contents. Click **[Refresh]** to refresh the log contents.

## WLAN Log (for the NPort IAW5000A-I/O Series)

MOX/	Total S	olution for Indus	trial Device Networking		www.m
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW5150A-6I/O - NPortIAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:2 - 1.0 Build 1
	Î :• W]	LAN Log			
- Main Menu	WLAN Log				
Overview					
Wizard					
Basic Settings					
- Network Settings					
- Serial Port Settings					
- Modbus Address Mapp	ing Table				
- I/O Settings					
- System Management					
- System Monitoring					
- Serial Status					
- System Status					
Network Connecti	ons				
Serial Data Log					
Relay Output Stat	us				
System Log			Clear log Dow	/nload Refresh	
WLAN Log					
WLAN Status					

The **WLAN Log** page is located under **System Status** in the **System Monitoring** folder. This is where you can view the log between the device server and the access points. It's a good tool for an engineer to troubleshoot if there is any issue with the wireless connection. Click **[Clear log]** to clear the log contents.

Click **[Download]** to save the log to a txt file for an engineer to troubleshoot, e.g., Moxa's Technical Support Team. Click **[Refresh]** to refresh the log contents.

## WLAN Status (for NPort IAW5000A-I/O Series)

ΜΟΧΛ	Total So	Total Solution for Industrial Device Networking							
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortlAW5150A-6I/O - NPortlAW5150A-6I/O_1 -	■ IP ■ Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>					
	Î :•WL	AN Status							
Main Menu	Auto refres	h							
Overview	Information								
Wizard	Active profile r	ame	Infrastructure						
Basic Settings	IP configuration		static						
- Network Settings	IP address		192.168.126.254						
- Serial Port Settings									
- Modbus Address Mapping	Table Netmask		255.255.255.0						
- I/O Settings	Gateway		N/A						
- System Management	Network type		Infrastructure Mode						
- System Monitoring	RF type		802.11ag						
- Serial Status	SSID		N/A						
- System Status	Channel		N/A						
Network Connection			Open System						
Serial Data Log									
Relay Output Status	Encryption		Disable						
System Log	Region		US						
WLAN Log	Signal strength	1	N/A						
WLAN Status	Connection sp	eed	1 Mb/s						
I/O Status	Current BSSID		N/A						
- Restart									

The **WLAN Status** page is located under **System Status** in the **System Monitoring** folder. This is where you can view the current WLAN settings and status.

## I/O Status

The **I/O Status** page is located under **System Monitoring** folder. On this page, you can monitor the current status and communication settings of DI and DO channels.

ΜΟΧΛ	Total S	Total Solution for Industrial Device Networking					
	NPortIAW5150A-6I/O NPortIAW5150A-6I/O_1	IP Serial No.	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410		
Main Menu	• I/O	Status					
Overview	DI Channel	mode	Status	Filter	Counter Trigger		
Wizard	DI-00	DI	OFF	12.5 ms			
Basic Settings	DI-01	DI	OFF	12.5 ms			
- Network Settings	DI-02	DI	OFF	12.5 ms			
- Serial Port Settings	DI-03	DI	OFF	12.5 ms			
- Modbus Address Mapping	Table DO Channel	mode	Status	ON Width	OFF Width		
- I/O Settings	DO-00	DO	OFF				
- System Management	DO-01	DO	OFF				
- System Monitoring							
- Serial Status							
- System Status							
I/O Status							

15

# Web Console: Restart

The following topics are covered in this chapter:

- Overview
- Restart
  - > Restart System
  - > Restart Ports

# **Overview**

This chapter explains how to use save your configuration changes and restart the NPort using the NPort web console. Configuration changes will not be effective until they are saved and the NPort is rebooted.

# Restart

# **Restart System**

MOX	<b>∧</b> °	Total So	www.moxa.cor			
<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortIAW - NPortIAW -	5150A-61/O 5150A-61/O_1	<ul><li>IP</li><li>Serial No.</li></ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
		• Sys	tem restart			
- Main Menu		!!! Warning !!!				
Overview			Clicking Restart	will disconnect all serial and Ethe	ernet connections and reboot	the system.
Wizard		NOTE: U	nsaved configuration	changes will be discarded, and d	ata currently in the middle of	transmission may be lost.
Basic Settings			0	<b>,</b>	-	
- Network Settings				Submit		
- Serial Port Settings				Cabinit		
- Modbus Address Map	pping Table					
- I/O Settings						
- System Management						
- System Monitoring						
- Serial Status						
- System Status						
I/O Status						
- Restart Restart System Restart Ports						

The **Restart System** page is located in the **Restart** folder. Click **[Restart]** to restart the NPort, and the new settings will take effect upon restart.

# **Restart Ports**

<ul> <li>Model</li> <li>Name</li> <li>Location</li> </ul>	- NPortlAW5 - NPortlAW5 -		<ul> <li>IP</li> <li>Serial No.</li> </ul>	- 192.168.126.254 - 1	<ul> <li>MAC Address</li> <li>Firmware</li> </ul>	- 44:39:C4:29:82:CC - 1.0 Build 16102410
		Rest	art Ports			
Main Menu		Select Ports				
Overview		Port 1				
Wizard						
Basic Settings				Submit		
- Network Settings						
- Serial Port Settings						
- Modbus Address Ma	pping Table					
- I/O Settings						
- System Managemen	t					
- System Monitoring						
- Serial Status						
- System Status						
I/O Status						
- Restart						
Restart System						
Restart Ports						

The **Restart Ports** page is located in the **Restart** folder. Select the desired serial and click **[Select All]** to select all serial ports. Click **[Submit]** to restart the selected serial ports.

16

# **Android API Instructions**

The following topics are covered in this chapter:

- □ Overview
  - ➢ How to Start MxNPortAPI
- MxNPortAPI Function Groups
- Example Program

# **Overview**

If you want to remote control your serial devices on an Android platform, then the MxNPortAPI is a simple application programming tool that 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 about the provided functions, please refer to the "MxNPortAPI Function Groups" section.

This MxNPortAPI is layered between the Android application and Android network manager framework. This Android library is compatible with Java 1.7, Android 3.1 (Honeycomb - API version 12), and later versions.



## How to Start MxNPortAPI

You can download the MxNPortAPI from Moxa's website at <u>http://www.moxa.com</u> and develop the application program in popular OSs, such as Windows, Linux, or Mac.

(You can refer the Android studio website to see the system requirements for development environment: <u>https://developer.android.com/studio/index.html?hl=zh-tw#Requirements</u>).

To start your application program, please unzip the MxNPortAPI file and refer to the index (.html) under the Help directory.

Organize 🔻 🛛 🏈 Open				= •	1
🔆 Favorites	Name	Date modified	Туре	Size	
🧮 Desktop	📗 com	11/22/2017 3:42 PM	File folder		
〕 Downloads	index-files	11/22/2017 3:42 PM	File folder		
🖳 Recent Places	la resources	11/22/2017 3:42 PM	File folder		
	allclasses-frame	11/8/2017 8:02 PM	HTML Document	2 KE	
詞 Libraries	allclasses-noframe	11/8/2017 8:02 PM	HTML Document	2 KE	
Documents	constant-values	11/8/2017 8:02 PM	HTML Document	19 KE	
👌 Music	Ø deprecated-list	10/26/2017 5:30 PM	HTML Document	4 KE	
E Pictures	🖉 help-doc	11/8/2017 8:02 PM	HTML Document	8 KE	
🛃 Videos	🖉 index	11/8/2017 8:02 PM	HTML Document	3 KE	
	index-all	10/26/2017 5:34 PM	HTML Document	46 KE	
🖳 Computer	Ø overview	11/8/2017 3:54 PM	HTML Document	16 KE	
	🕖 overview-summary	11/8/2017 8:02 PM	HTML Document	20 KE	
🙀 Network	🔊 overview-tree	11/8/2017 8:02 PM	HTML Document	6 KE	
	🗋 package-list	11/8/2017 8:02 PM	File	1 KE	
	🕱 script	11/8/2017 8:02 PM	JScript Script File	1 KE	
	🕖 serialized-form	11/8/2017 8:02 PM	HTML Document	5 KE	
	stylesheet	9/15/2017 5:41 PM	Cascading Style S	14 KE	

For more details about the installation, please refer to the Overview section.

All Classes	JavaScript is disabled on your browser.		
MxException	OVERVIEW PACKAGE CLASS TREE INDEX HELP		
McException.ErrorCode McAIPort	PREV NEXT FRAMES NO FRAMES ALL CLASSES		
MxNPort.FlowCtrl MxNPort.loctlMode	This document is the programming guide for the MxNPortAPI.		
MxNPort.LineError MxNPort.ModemStatus MxNPortService Version	See: Description		
	Packages		
	Package Description		
	com.moxa.mxnportapi		
	This document is the programming guide for the MXNPortAPI You can get information about how to code with the MXNPortAPI quickly and how to link the MXNPortAPI Library into your program.  Introduction to the NPort Android API  Android Platform Application (Phone, Contacts, Camera) Java API Frameworks (USB, Package, Location) Libraries Dalvik Runtime 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();
```

# A

# SNMP Agents with MIB II & RS-232-Like Groups

The NPort has built-in SNMP (Simple Network Management Protocol) agent software that supports SNMP Trap, RFC1317 RS-232 like groups and RFC 1213 MIB-II. The following table lists the standard MIB-II groups, as well as the variable implementation for the NPort.

# **RFC1213 MIB-II Supported SNMP Variables**

## System MIB

SysDescr SysObjectID SysUpTime SysContact SysName SysLocation SysServices

# **Interfaces MIB**

itNumber	ifOperStatus
ifIndex	ifLastChange
ifDescr	ifInOctets
ifType	ifInUcastPkts
ifMtu	ifInNUcastPkts
ifSpeed	ifInDiscards
ifPhysAddress	ifInErrors
ifAdminStatus	ifInUnknownProtos

ifOutOctets ifOutUcastPkts ifOutNUcastPkts ifOutDiscards ifOutErrors ifOutQLen ifSpecific

# IP MIB

ipForwarding ipDefaultTTL ipInreceives ipInHdrErrors ipInAddrErrors ipForwDatagrams ipInUnknownProtos ipInDiscards ipInDelivers ipOutRequests ipOutDiscards ipOutNoRoutes ipReasmTimeout ipReasmReqds ipReasmOKs ipReasmFails ipFragOKs ipFragFails ipFragCreates ipAdEntAddr ipAdEntIfIndex ipAdEntNetMask ipAdEntBcastAddr ipAdEntReasmMaxSize IpNetToMediaIfIndex IpNetToMediaPhysAddress IpNetToMediaNetAddress IpNetToMediaType IpRoutingDiscards

## **ICMP MIB**

- IcmpInMsgs IcmpInErrors IcmpInDestUnreachs IcmpInTimeExcds IcmpInParmProbs IcmpInSrcQuenchs IcmpInRedirects IcmpInEchos IcmpInEchoReps
- IcmpInTimestamps IcmpTimest ampReps IcmpInAddrMasks IcmpOutMsgs IcmpOutErrors IcmpOutErrors IcmpOutDestUnreachs IcmpOutTimeExcds IcmpOutParmProbs IcmpOutSrcQuenchs
- IcmpOutRedirects IcmpOutEchos IcmpOutEchoReps IcmpOutTimestampReps IcmpOutAddrMasks IcmpOutAddrMaskReps

# **UDP MIB**

UdpInDatagrams	UdpOutDatagrams
UdpNoPorts	UdpLocalAddress
UdpInErrors	UdpLocalPort

# Address Translation

AtIfIndex AtPhysAddress AtNetAddress

## TCP MIB

tcpRtoAlgorithmtcpEstabResetstcpRtoMintcpCurrEstabtcpRtoMaxtcpInSegstcpMaxConntcpOutSegstcpActiveOpenstcpRetransSegstcpPassiveOpenstcpConnStatetcpAttempFailstcpConnLocalAddress

tcpConnLocalPort tcpConnRemAddress tcpConnRemPort tcpInErrs tcpOutRsts

# SNMP MIB

snmpInPkts snmpOutPkts snmpInBadVersions snmpInBadCommunityNames snmpInASNParseErrs snmpInTooBigs snmpInNoSuchNames snmpInBadValues snmpInReadOnlys snmpInGenErrs snmpInTotalReqVars snmpInTotalSetVars snmpInGetRequests snmpInGetNexts snmpInSetRequests snmpInGetResponses snmpInTraps snmpOutTooBigs snmpOutNoSuchNames snmpOutBadValues

snmpOutGenErrs snmpOutGetRequests snmpOutGetNexts snmpOutSetRequests snmpOutGetResponses snmpOutTraps snmpEnableAuthenTraps

# **RFC1317: RS-232 MIB Objects**

# **Generic RS-232-like Group**

rs232Number

# **RS-232-like General Port Table**

rs232PortTable rs232PortEntry rs232PortIndex rs232PortType rs232PortInSigNumber rs232PortOutSigNumber rs232PortInSpeed rs232PortOutSpeed

# **RS-232-like Asynchronous Port Group**

rs232AsyncPortTable rs232AsyncPortEntry	rs232AsyncPortIndex rs232AsyncPortBits	rs232AsyncPortStopBits rs232AsyncPortParity
The Input Signal Table		
rs232InSigTable	rs232InSigPortIndex	rs232InSigState

rs232InSigTable	rs232InSigPortIndex	rs
rs232InSigEntry	rs232InSigName	

# The Output Signal Table

rs232OutSigTable	rs232OutSigPortIndex	rs232OutSigState
rs232OutSigEntry	rs232OutSigName	

# **MTConnect Glossary**

Application: A process or set of processes that access the MTConnect® Agent to perform some tasks.

**Component:** A part of a device that also can have sub-components and data items. A component is the basic building block of a device.

**Current:** A snapshot request to the Agent to retrieve the current values of all the data items specified in the path parameter. If no path parameter is given, then the values for all components are provided.

**Data Item:** A data item provides the descriptive information regarding something that can be collected by the Agent.

**Device:** A piece of equipment capable of performing an operation. A device may be composed of a set of components that provides data to the application. The device is a separate entity with at least one component or data item providing information about the device.

Event: An event represents a change in state that occurs at a point in time.

#### **NOTE** An event does not occur at predefined frequencies.

HTTP: Hyper-Text Transport Protocol. The protocol used by all web browsers and web applications.

Probe: A request to determine the configuration and reporting capabilities of the device.

**Sample:** A sample is a data point from within a continuous series of data points. An example of a sample is the position of an axis.

Stream: A collection of events, samples, and conditions organized by devices and components.

Tag: Used to reference an instance of an XML element.

**UUID:** Universally unique identifier.

XML: Extensible Markup Language. http://www.w3.org/XML/

# **Well-Known Port Numbers**

Listed below are well-known port numbers that may cause network problems if they are assigned to an NPort serial port. Refer to RFC 1700 for well-known port numbers or refer to the following introduction from IANA.

The port numbers are divided into three ranges: Well-Known Ports, Registered Ports, and Dynamic and/or Private Ports.

- Well-Known Ports range from 0 through 1023.
- **Registered Ports** range from 1024 through 49151.
- Dynamic and/or Private Ports range from 49152 through 65535.

The well-known ports are assigned by 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, please visit the IANA website at http://www.iana.org/assignments/port-numbers.

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	Simple Mail Transfer Protocol (SMTP)
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 to 223	Reserved for future use
502	Modbus TCP Protocol

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	Gopher 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 (NTP)
161	Simple Network Mail Protocol (SNMP)
162	SNMP Traps
213	IPX (Used for IP Tunneling)

# **Ethernet Modem Commands**

A serial port on the NPort can be set to Ethernet Modem mode, allowing a PC or device to connect to the NPort as if it was an Ethernet modem. This section provides additional detail about how the NPort operates in Ethernet Modem mode.

# **Dial-in Operation**

The NPort can listen for a TCP/IP connection request from a remote Ethernet modem or host. The NPort's response depends on the ATS0 value, as follows.

**ATS0=0**: 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.

**ATSO** $\geq$ **1**: The NPort will accept the TCP connection immediately. It will send the "**CONNECT** {*baudrate*}" command to the serial port and will immediately enter data mode.

# **Dial-out**

The NPort accepts ATD commands such as "**ATD 192.168.1.1:4001**" from the serial port. It will then request a TCP connection from the specified remote Ethernet modem or PC. Once the remote unit accepts this TCP connection, the NPort will send the "**CONNECT** {*baudrate*}" command to the serial port and will immediately enter data mode.

# **Disconnection Request from Local Site**

When the NPort is in data mode, you can initiate disconnection by sending "+++". Some applications allow you to directly set the DTR signal to off, which will also initiate disconnection. The NPort will enter command mode, and you can then enter "**ATH**" to close the TCP connection "**NO CARRIER**" will be returned to the serial port.



#### ATTENTION

When entering "+++" to disconnect, the three "+" characters must be sent in quick succession, and the sequence must be prefaced and followed by a guard time to protect the raw data. You can change the disconnect character using register S2. You can set the guard time using register S12.

# **Disconnection Request from Remote Site**

After the TCP connection has been closed by the remote Ethernet modem or PC, the NPort will send "**NO CARRIER**" to the serial port and will return to command mode.

# **AT Commands**

Ethernet Modem mode supports the following common AT commands, as used with a typical modem:

No.	Command	Description	Remarks
1	ATA	Answer manually	
2	ATD	Dial up specified IP address and port number	
		ATD 192.168.1.1:950 (example)	
3	ATE	ATE0=Echo OFF	
		ATE1=Echo ON (default)	
4	ATH	ATH0=On-hook (default)	
		ATH1=Off-hook	
5	ATI, ATIO,	Modem version	reply "OK" only
	ATI1, ATI2		
6	ATL	Speaker volume option	reply "OK" only
7	ATM	Speaker control option	reply "OK" only
8	ATO	On line 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"
13	ATV	Result code type	
		ATV0 for digit code,	
		ATV1 for text code (default)	
		0=OK	
		1=connect	
		2=ring	
		3=No carrier	
		4=error	
14	ATZ	Reset (disconnect, enter command mode and restore the	
		flash settings)	
15	AT&C	Serial port DCD control	
		AT&C0=DCD always on	
		AT&C1=DTE detects connection by DCD on/off (default)	
16	AT&F	Restore manufacturer's settings	
17	AT&G	Select guard time	reply "OK" only
18	AT&R	Serial port RTS option command	reply "OK" only
19	AT&S	Serial port DSR control	reply "OK" only
20	AT&V	View settings	
21	AT&W	Write current settings to flash for next boot up	

# **S** Registers

No.	Register	Description	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	no action applied
		(always=6, unit 1/10 sec)	
11	S10	Delay for hang up after carrier	no action applied
		(always=14, unit 1/10 sec)	
12	S11	DTMF duration and spacing	no action applied
		(always=100 ms)	
13	S12	Escape code guard time	
		(default=50, unit 1/50 sec)	
		to control the idle time for " $+++"$	

# Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### **CAUTION:**

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

#### FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

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
- This device must accept any interference received, including interference that may cause undesired operation.

#### Labeling requirements

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.

#### **RF** exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

#### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: SLE-IAW5000A "

#### Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an

OEM or integrator, but should not be distributed to the end user.

- 1. This device is intended for OEM integrators only.
- 2. Please see the full Grant of Equipment document for other restrictions.

This radio transmitter FCC ID: SLE-IAW5000A has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

#### Antenna List

No.	Manufacturer	Model No.	Antenna Type	Peak Gain
1	KINSUN	ANT-WDB-ARM-02 (Part No.	Dipole Antenna	2.04 dBi for 2.4 GHz
		6602D03081)		0.38 dBi for 5 GHz

Note: The antenna connector is Reverse SMA type.