NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

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Released on May 31, 2019

About Moxa

Moxa is a leading provider of edge connectivity, industrial networking, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With over 30 years of industry experience, Moxa has connected more than 50 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures. Information about Moxa's solutions is available at <u>www.moxa.com</u>.

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NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

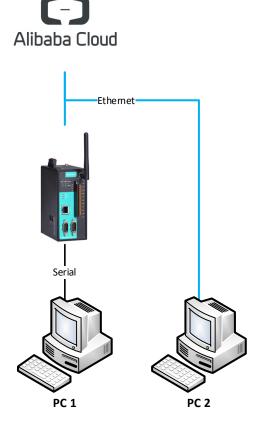
1. Introduction

The NPort IA5000A-I/O and NPort IAW5000A-I/O serial device servers, which have built-in digital I/Os, provide maximum flexibility when you need to integrate serial equipment in the field with an Ethernet network or cloud platform. From Firmware Version 2.0 onwards, they support communications with IIoT applications, using generic MQTT or third-party cloud services, such as Azure and Alibaba Cloud.

This document demonstrates how to use the NPort IA5000A-I/O or NPort IAW5000A-I/O serial device to connect to Alibaba Cloud IoT Platform. We also demonstrate how to publish serial or I/O data messages to the cloud and subscribe messages from the cloud.

2. System Topology

Figure 1 illustrates the system topology. PC1 runs PComm Lite to act as a serial device. It connects to Port 1 of the NPort IA5000A-I/O or NPort IAW5000A-I/O serial device. The NPort IA5000A-I/O or NPort IAW5000A-I/O acts as an Alibaba Cloud device and connects to Alibaba IOT Platform. PC2 accesses Alibaba Cloud Console.



< Figure 1. System Topology >

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2.1 Creating a Product and Device on Alibaba

- Use Alibaba user account to log in to Alibaba Cloud Console. Website: <u>https://www.alibabacloud.com/</u>
- 2. Select the region you want.

	E C-) Alibaba Cloud	China (Shanghai) 🔫	Q	Billing Management	More	<u>0</u> •	English	
	- Alibaba ciouu	China (Shanghai) +	ď	Dining Management	More	4	Linglish	
lo	oT Platform	Quick Start Get started by referring to the following guide						
G	Quick Start	Connection Service						
C	Devices ^							
	Product							
	Device							
	Group							
R	lules	Connect to Devices						
N	laintenance ~	Quickly connect your computer or device to Alibaba Cloud IoT platform.						
C	ocumentation	Start						ç
								Contact Us

3. Create a new IoT Platform Product: **IoT Platform → Devices → Product → Create Product**.

=	C-) Alibaba Cloud	China (Shanghai) 👻			Q Billing Managemen	nt More	۵.	English	0
IOT F	Platform	Products							
	k Start	My Products (2)							
Devi	roduct	Product List				Refresh		Create Pro	duct
D	levice	Search by product name		Search					
G Rule	sroup	Product Name	ProductKey	Node Type	Created At	Action	ns		
Main	tenance ~								
Doci	umentation			No products found.					Conta



NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

Set the product's settings as below. Click the \mathbf{OK} button at the bottom.

- Product Name: MOXA_NPorts
- Node Type: Device
- Connect to Gateway: No
- Network Connection Method: Ethernet
- Data Type: Do not parse/Custom

jha	ai) 🔻	α	BIII
t	Create Product	×	
L.	Product Information		
t	* Product Name MOXA_NPorts		
h	Node Type		
u	* Node Type Cateway Gateway		.t
	* Connect to Gateway Ves No		
l	Network Connection and Data Format		
	Network Connection Method Ethernet		
	* Data Type		
	Do not parse/Custom		
	More		

After completing the above steps, the product name "MOXA_NPorts" will appear in **Product List**.

= C-) Alibaba Cloud	China (Shanghai) 🔻			Q Billing Managemen	nt More 🛕 Englis	h
IoT Platform	Products					
Quick Start	My Products (1)					
Devices ^						
Product	Product List				Refresh Create F	Product
Device	Search by product name	Select Product Tag	∽ Search			
Group						
Rules	Product Name	ProductKey	Node Type	Created At	Actions	
Maintenance ~	MOXA_NPorts		Device	05/17/2019, 21:32:37	View Delete	
Documentation						0
						Contact Us
						S

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

4. The next step is to add a new IoT Platform Device: **IoT Platform → Devices → Device.**

😑 🕞 Alibaba Clo	ud	China (Shanghai) 👻			Q Billing Manageme	nt More	۵.	English	0
IoT Platform		Products							
Quick Start		My Products (1)							
Product	^	Product List				Refresh		Create Pro	duct
Device		Search by product name	Select Product Tag	 ✓ Search 					
Group		Product Name	ProductKey	Node Type	Created At	Actio	ons		
Maintenance	\sim	MOXA_NPorts		Device	05/17/2019, 21:32:37	View	Dele	te	
Documentation									

On the **Device** page, click **Add Device**.

=	C-) Alibaba Cloud	China (Shanghai) 👻			Q Billing Management Mor	re 🛕 English 👰
IOT F	Platform	Devices	Total 📀	Activate 💿	• Online 💿	-
	k Start	All 🗸	Devices:	Device	0	Refresh
Devi P	roduct	Device List Batch Manag				J
D	evice					
G	roup	Device List			Batch Add	Add Device
Rule	S	DeviceName V Enter the value	ue.DeviceName	Select a device tag.	Search	
	tenance ~	DeviceName/Alias	Product	Node Type State/Ena	abled Last Online	Actions
						Contact Us
				i No devices found.		

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

On the pop-up page, select **MOXA_NPorts** in the drop-down menu under **Product**, and fill in "NPort" under **DeviceName**.

 Note: When the device as the deviceName. 	Name is left blank, Alibaba Cloud w	rill assign a GUID
* Product :	-	
MOXA_NPorts	~	
DeviceName :		
NPort		0
Note name:	•	
Enter an alias.		0

After clicking **OK**, the device certificate will appear. Click **Close** and exit this window.

 Device certificate Keep it in a safe 	e is used to authentica place.	te devices conn	ecting to the	platform.
ProductKey 👩		Сору		
DeviceName	NPort Copy			
DeviceSecret 🕘	******** Show			

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

Next, "NPort" will appear under **DeviceName/Alias** in the **Device List**.

😑 🕞 Alibaba Cloud	China (Shanghai) 🕶		Q Billing Management More	🕂 English 🗿
IoT Platform	Devices			
Quick Start	All ~ 1	Activate Device 0	• Online O	Refresh
Product	Device List Batch Management			
Device				
Group	Device List		Batch Add	Add Device
Rules	DeviceName V Enter the value.DeviceName	Select a device tag.	Search	
Maintenance \lor Documentation	DeviceName/Allas Produc	t Node Type State/En	abled Last Online	Actions
	NPort MOXA	_NPorts Device • Inactive	e 💽 —	View Delete
	Delete Disable Enable			_

2.2 Set Up NPort IA5000A-I/O and NPort IAW5000A-I/O to Connect to Alibaba Cloud IoT Platform

 Log in to the NPort IA5000A-I/O or NPort IAW5000A-I/O's web console. Set the correct time setting on the **Basic Settings** page. Also fill in **Time server** to correct the NPort's time-on period. You can find the NTP service at <u>https://www.pool.ntp.org/zone/@</u>

Time Settings		
Time zone	(GMT+08:00)Taipei	•
Local time (24-hour)	2019 / 05 / 17 22 : 23 : 49	
Time server	asia.pool.ntp.org	

 Under Main Menu → IoT Management → IoT Mode, set IoT platform as "Alibaba Cloud IoT Platform".

Dania Cattinga	
Basic Settings	
loT platform	Alibaba Cloud IoT Platform 👻

The IoT Mode is running with Alibaba Cloud IoT Platform; it will show more settings about the platform as below:

Alibaba Cloud IoT Platform Settings				
Server domain (Region)	Shanghai 👻			
Product key				
Device name				
Device secret				
Keep alive	60 (60 - 180 sec.)			

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• IoT Mode

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

3. Go back to Alibaba Cloud Console. Information about the device certificate, you can find under **IoT Platform → Devices → Device → Device List → NPort → View**.

= C-) Alibaba Cloud	China (Shanghai) 🕶			Q B	iilling Management More	e 🛕 English 👰
IoT Platform	Devices					
Quick Start	All	Total 🕝 Devices:	Activate Device	0	• Online 💿 0	Refresh
Devices ^		1	U			
Product	Device List Batch Manageme	ent				
Device						
Group	Device List				Batch Add	d Add Device
Rules	DeviceName ✓ Enter the value.De	eviceName	Select a device tag.	∽ Sea	arch	
Maintenance ~						
Documentation	DeviceName/Alias	Product	Node Type	State/Enabled	Last Online	Actions
	NPort	MOXA_NPorts	Device	 Inactive 	-	View Delete Us

Under Alibaba Cloud IoT Platform settings, there are several connectivity information fields. They can be found under **Device** on the Alibaba Cloud Platform as below:

E C-) Alibaba							
oT Platform		Devices > Device	e Details				
Quick Start		NPort Inactive	1				
evices	~	Product : MOXA_I	Ports View	ProductKey 1	Сору	DeviceSecret : ***	****** Show
Product		Device Inform	ation Topic List S	tatus Events	Invoke Service Devi	ce Shadow Ma	anage Files Device Log
Device							
Group		Device Informa	tion	_			
Rules		Product Name	MOXA_NPorts	ProductKey	Copy	Region	China (Shanghai)
laintenance	\sim	Node Type	Device	DeviceName	NPort Copy	DeviceSecret	******* Show
ocumentation		Alias 👩	Edit	IP Address	-	Firmware Version	-
		Created At	05/17/2019, 21:45:11	Activated At		Last Online	
				Real-time Delay	Test		

Set as below:

Alibaba Cloud IoT Platform Settings	
Server domain (Region)	Shanghai 👻
Product key	
Device name	NPort
Device secret	
Keep alive	60 (60 - 180 sec.)

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

If your region is not included in the drop-down menu, choose "User Defined" and fill in the region domain address.

Alibaba Cloud IoT Platform Settings		
Server domain (Region)	User Defined 👻	iot-as-mqtt.cn-shanghai.aliyuncs.com

The region domain address format is iot-as-mqtt.\${region}.aliyuncs.com. In this format, the variable \${region} indicates the region's ID of region's IoT Platform service. For region IDs, see https://www.alibabacloud.com/help/doc-detail/40654.htm?spm=a2c63.p38356.a3.10.73a95f07Czw8z8

4. Go back to Alibaba Cloud and click **Topic List**.

E Alibaba Cloud	China (Shanghai) 🔻				Q Billi	ing Management More 🛕 Engli	ish 🌔
IoT Platform	Devices > Device	e Details					
Quick Start	NPort Online Product : MOXA_I		ProductKey	Сору	DeviceSecret : ****	**** Show	
Product	Device Inform	ation Topic List Status	Events Invoke S	ervice Device Shadow	Manage Files Dev	ice Log	
Device	Device Informa	tion					
Group	Device informa	lion					
Rules	Product Name	MOXA_NPorts	ProductKey	Copy	Region	China (Shanghai)	
Maintenance ^	Node Type	Device	DeviceName	NPort Copy	DeviceSecret	******** Show	
Real-time Monitoring	Alias 🁩	Edit	IP Address		Firmware Version	app-1.0.0-20180101.1000	
Online Debug Device Log	Created At	05/17/2019, 21:45:11	Activated At	05/17/2019, 22:00:12	Last Online	05/17/2019, 22:46:53	
Firmware Update	Current Status	Online	Real-time Delay	Test			
Remote Config.							
Documentation	More Device In	formation					

You will find two topics: /{ProductKey}/{DeviceName}/user/*. One is a publish topic; the other is a subscribe topic.

= C-) Alibaba Cloud	China (Shanghai) 👻		Q Billing Managemen	t More	≙. English	0
IoT Platform	Devices > Device Details					
Quick Start	NPort Online Product : MOXA_NPorts View ProductKey	DeviceS	ecret : ******** Show			
Devices ^ Product	Device Information Topic List Status Events Invoke Service Device Sha		Device Log			
Device	Device Topic List 💿					
Rules	Device Topic		Published Notifications:	Actions		
Maintenance ^	/sys/a1ckn9TMa5u/NPort/thing/model/up_raw	Publish				
Online Debug	/sys/a1ckn9TMa5u/NPort/thing/model/down_raw	Subscribe				Contact U
Device Log	Port/user/update	Publish	0	Publish		~
Firmware Update Remote Config.	/a1ckn9TMa5u/NPort/user/update/error	Publish	0	Publish		
Documentation	A A A A A A A A A A A A A A A A A A A	Subscribe	0	Publish		

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

Copy the publish topic to Alibaba IoT Publish topic for all serial ports and I/O topics, and copy the subscribe topic to Alibaba IoT Subscribe topic for all serial ports and I/O topics. Set as below:

Device Topic List 💿				Ľ	Serial and I/O Message Format Setti	ings
Device Topic	Device Authorizations:	Published Notifications:	Actions		Serial message format Serial JSON message definition I/O JSON message definition	NORL ISIN NORL ON NORL ON
/systation and a second s	Publish		ontact U		I/O publish trigger mode Alibaba IoT Publish	Specific VO change 👻 DI-00 👻
/sysection was readered and reade	Subscribe				Serial port 2	Topic (Art Band SuNPort/user/update DoS 1 - Topic (Art Band SuNPort/user/update DoS 1 -
the house of the second s	Publish	0	Publish		NO Alibaba loT Subscribe	Topic /a test TMus of NPort/user/update DoS 1 -
A Port/user/update/error	Publish	0			Serial port 2	Topic
With Market WPort/user/get	Subscribe	0	Publish		ю	Topic //d an an assiPort/user/get DoS 1 -

5. Click Submit. The NPort IA5000A-I/O or NPort IAW5000A-I/O will connect to Alibaba Cloud IoT Platform, and you can check that Connection status reads "Connected" under Alibaba IoT Connection Monitoring as below:

Alibaba IoT Connection Information				
Target	iot-as-mqtt.cn-shanghai.aliyuncs.com			
Connection status	Connected			
Diagnostics log	2019/05/17 22:03:22 Connecting 2019/05/17 22:03:28 Connected successfully			

Also, you will see that the device is online, as shown below:

= C-) Alibaba Cloud	China (Shanghai) 🔫	Q B	lling Management More 🏠 English 🌀
IoT Platform	Devices		
Quick Start	All V	Activate Device 1	Online Refresh
Product	Device List Batch Management		
Device			
Group	Device List		Batch Add Add Device
Rules	DeviceName \checkmark Enter the value.DeviceName	Select a device tag.	rch
Maintenance \sim			
Documentation	DeviceName/Alias Product	Node Type State/Enabled	Last Online Actions
	NPort MOXA_NPC	rts Device • Online	05/17/2019, 22:05:52 View Delete

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

3. Upload/Download Serial Pattern and I/O Status With

Cloud

In this section, we will instruct you how the NPort IA5000A-I/O and NPort IAW5000A-I/O (in the section belows, referred to as NPort or NPorts) send serial patterns to the cloud and receive patterns from the cloud. If a DI is triggered, the NPorts will publish the I/O status to the cloud, and publish a message from the cloud to the NPorts to change the I/O status. The NPorts support three types of message formats: JSON, RAW with header, and RAW. For this demonstration, we use JSON format. For **Serial Message format**, select "JSON", and for **I/O publish trigger mode**, select "Specific I/O change" along with "DI-00".

Serial and I/O Message Format Set	tings	
Serial message format		
Serial JSON message definition	Serial JSON	
I/O JSON message definition	I/O JSON	
I/O publish trigger mode	Specific I/O change 👻 DI-00 👻	
Alibaba loT Publish		
Serial port 1	Topic ####################################	QoS 1 👻
Serial port 2	Topic /accust the ou/NPort/user/update	QoS 1 👻
I/O	Topic /ascharger/update	QoS 1 👻
Alibaba loT Subscribe	Contraction Contraction (Contraction)	
Serial port 1	Topic // teacher //NPort/user/get	QoS 1 👻
Serial port 2	Topic vation www.NPort/user/get	QoS 1 👻
I/O	Topic ////www.skiaSu/NPort/user/get	QoS 1 👻

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

For the purpose of this demonstration, we we will show you the text content of the data we upload to the cloud platform. Click the **Serial JSON** button to uncheck the **enable Base64 Encode/Decode for serial data** checkbox. JSON format does not support special characters. If needed, set **Encode/Decode for serial data**. For more about JSON format rules, please reference http://json.org/

: Serial JSON Message Definition

"msgVer"	:	"1.0",	
"gwID"	:	"NPortIAW5250A-12I/O_2647",	
"devID"	:	"SerialPort1",	line port 1 💿 port 2 (devID is referred to Alias in Ser
"dateTime"	:	"2018-08-27T15:43:14+08:00",	enable
"msgNumber"	:	0-65535,	i enable
"msgType"	:	"Data",	
"msgFrame"	:	"Raw data from serial port"	🔲 enable Base64 Encode/Decode for serial data

Note:

You must fill in serial **alias name**, which is an identifiable ID for serial data on "Serial Parameter" page.

	• Serial Par	rameter								
* Modifyi	ng "Serial Parameter" settir	ngs will cause the	serial ports to restart connectio	ns.						
Port	Alias	Alias code	Baud rate	Parity	Data bit	Stop bit	Flow control	FIFO	Interface	
1	SerialPort1	p1	115200 ▼	None v	8 🔻	1 🔻	RTS/CTS V	Enable •	RS-232	,
2	SerialPort2	p2	115200 ▼	None v	8 🔻	1 🔻	RTS/CTS V	Enable •	RS-232	'
			Submit							

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

In this demonstration, we use the NPorts' DO-00 to trigger DI-00 (connect DO-00 to DI-00 by wire).



3.1 Send Serial Pattern From the Device to the Cloud

In this section, we will instruct you on how to send serial data to the cloud. We will send a serial pattern from PC 1 through the NPort to the cloud so that Alibaba Cloud can receive a message from the NPort.

 Log in to the NPort's web console and change Serial Port 1's **Operation mode** to "IoT" and **Force transmit** to 500. The NPorts support various types of Data Packing combinations. In this demonstration, we use **Force transmit**. If needed, set the correct **Data Packing** method.

Port Settings	
Port	1
Operation mode	IoT 👻
Sniffer mode	Enable (Subscribed messages will be dropped)
Data Packing	
Packet length	0 (0 - 2880)
Delimiter 1	00 (HEX) Enable
Delimiter 2	00 (HEX) Enable
Delimiter process	Do Nothing • (Processed only when the packet length is 0)
Force transmit	500 (0 - 65535 ms)
Apply the above settings to all serial ports	

• Operation Mode

Click **Submit** to activate the new settings.

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

:•Operation Mode

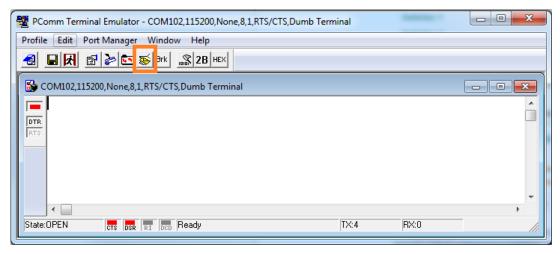
Port	Operating mode	Packet length	Delimiter 1	Delimiter 2	Delimiter process	Force transmit
1	loT	0	00 (Disable)	00 (Disable)	Do Nothing	500
	D. J. COM	0	00 (Disable)	00 (Disable)	Do Nothing	0
2	Real COM	Max connection:	1			

- 2. Launch PComm Terminal Emulator on PC 1 and open COM Port with the NPort's serial default settings as below:
 - Port number: PC 1's native COM port connecting to the NPort's Port 1
 - Baud rate: 115200
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: RTS/CTS

Property				×
Communication F	ara	meter Terminal	File Transfer	Capturing
Pro	otoc ters	looner	•	
COM1 COM101	-	Baud rate:	115200	-
COM102 COM103 COM104		Data bits:	8	-
COM105 COM106 COM107	=	Parity: Stop bits:	None	- -
COM108 COM109 COM110		Flow control:	RTS/CTS	
COM111 COM112		RTS state:		
COM113 COM114	Ŧ	DTR state:	ON COF	
Default			ОК	Cancel

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

 Click the Send Pattern button, or on the toolbar, select Port Manager → Send Pattern to send a serial pattern.



On the Send Pattern window, select **ASCII** and fill in "MOXA"; then, select **Repeat count** and enter **1**. Click **Start Send** to send the pattern.

Send Pattern	markets, without
Data Pattern C ASCII HOXA	Start Send
C HEX 4D4F5841	Cancel
C Range (Hex) Start: To:	
C File	
Count	
C Send until user break	
C Repeat count: 1	
Thterval time: 1000 (100ms ~ 60000ms)	
🗖 Set all ports to send pattern simultaneously	

On Alibaba Cloud, you can check the message on **Device Log > Upstream Analysis**. Find the latest message and copy the MessageID. You can check the topic on **Content(All)**, which is an Alibaba IoT Publish topic.

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

= C-) Alibaba Cloud	China (Shanghai) 🕶			Q Billing Mana	gement More	<u>∩</u> • English	(
IoT Platform	Device Log 💿						
Quick Start	Product : MOXA_NPorts ~						
Devices ^							
Product	Device Actitivity Analysis TS	SL Data Analysis Upstream	Analysis Downstream	Analysis Mess	age Query		
Device	Enter a DeviceName	Enter a MessagelD	All	√ 1Hour	Searc	h Reset	
Group							
Rules	Time	MessageID	DeviceName	Status	Content	Cause	
Maintenance ^	2019/05/17 22:44:50.505	1129397368530156544	NPort	Successful	Publish		
Real-time Monitoring Online Debug	2019/05/17 22:44:43.497	1129397339144863233	NPort	Successful	Publish		
Device Log	2019/05/17 22:44:43.596	1129397339560114688	NPort	Successful	Publish		
Firmware Update	2019/05/17 22:44:43.597	1129397339555921408	NPort	Successful	Publish		
Remote Config.	2019/05/17 22:43:24.989	1129397009845863424	NPort	Failed	Publish	No authoriz	

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Select the **Message Query** tab, paste the MessageID, and click **Search**. The content of MessageID will then be shown. Under **Content**, select "Raw Data" to allow the NPort's message to be readable.

😑 🕞 Alibaba Cloud	China (Shanghai) 🕶	Q Billing Management More 🛕 English 👩
IoT Platform	Device Log 💿	
Quick Start	Product : MOXA_NPorts ~	
Devices ^		
Product	Device Actitivity Analysis TSL Data Analysis Upstream Analysis Downstream Analysis Message	ge Query
Device	1129397368530156544	Search Reset
Group		
Rules	Time Topic	Content Raw Data 🗸
Maintenance ^	05/17/2019, 22:44:50	{"msgVer"."1.0", "gwlD"."NPortIAW5250A-12I/O
Real-time Monitoring		
Online Debug		
Device Log		
Firmware Update		
Remote Config.		
Documentation		

Move the cursor of your mouse over the message, and you will find the serial data pattern filled in the msgFrame.

Message Query	
	Search Reset
A- (12	nsgVer":"1.0","gwID":"NPortIAW5250 × /O_2647","msgType":"Data","devID" erialPort1","msgFrame":"MOXA"}
{"msg	Ver":"1.0","gwID":"NPortIAW5250A-12I/O

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

3.2 Send Serial Data from the Cloud to the Device

In this section, we will instruct you on how to send serial data to PC 1 from the cloud. We use Alibaba Cloud Console to send an IoT message to the NPort's Serial Port 1.

1. Click Serial JSON.

-IoT Mode

Basic Settings	
IoT platform	Alibaba Cloud IoT Platform 👻
Alibaba Cloud IoT Platform Settings	
Server domain (Region)	Shanghai 👻
Product key	
Device name	NPort
Device secret	CHARTER STRONG TO BE FURTH
Keep alive	60 (60 - 180 sec.)
Serial and I/O Message Format Sett	ings
Serial message format	JSON -
Serial JSON message definition	Serial JSON
I/O JSON message definition	NOSL O/I
I/O publish trigger mode	Specific I/O change 👻 DI-00 👻

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

Copy Subscribe JSON Message:

Publish JSON Me	essage				
"msgVer"	1	"1.0",			
"gwID"	1	"NPortIAW5250A-12I/O_2647",			
"devID"	:	"SerialPort1",			
"dateTime"	:	"2018-08-27T15:43:14+08:00",			
"msgNumber"	:	0-65535,			
"msgType"	:	"Data",			
"msgFrame"	:	"Raw data from serial port"			
Subscribe JSON	Messag	e			
"msgVer"	:	"1.0",			
"gwlD"	:	"NPortIAW5250A-12I/O_2647",			
"devID"	:	"SerialPort1",			
	"msgType" : "Data",				
"msgType"	1	"Data",			

 The copied message has a lot of space and line feed. We can use a tool to compact it. Below is a free online tool:

https://jsonformatter.org/json-minify

Paste the message in the column on the left and change the msgFrame stating "Raw data to serial port" to read: "Hi MOXA NPort", then click **Minify JSON**. It will show a compact JSON format message in the column on the right side. Click **Copy to Clipboard**.



NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

3. On Alibaba Cloud, click **Publish** next to the **Subscribe** topic.

😑 🕞 Alibaba Cloud	China (Shanghai) 🕶		Q Billing Management More 🛕 English 🕘
IoT Platform	Devices > Device Details		
Quick Start	NPort Online Product : MOXA_NPorts View ProductKey : ::::::::::::::::::::::::::::::::::	Copy	DeviceSecret : ******* Show
Devices ^	Device Information Topic List Status Events	Invoke Service	Device Shadow Manage Files Device Log
Device	Device Topic List 💿		
Group Rules	Device Topic	Device Authorizations:	Published Octions
Maintenance A	/sys/ancreasesemPort/thing/model/up_raw	Publish	
Real-time Monitoring Online Debug	/sys/amakun/hite/NPort/thing/model/down_raw	Subscribe	
Device Log	Port/user/update	Publish	1 Publish
Firmware Update Remote Config.	vide/control/user/update/error	Publish	0 Publish
Documentation	national su/NPort/user/get	Subscribe	0 Publish

To publish a topic to the NPort's Serial Port 1: in the **Publish** window, paste the clipboard message in the big text area, then select **1** under **Qos**, and click **OK**.

Publish		×
 Exercise caution if this not be subscribed by 	s topic is being used. The messages put the server.	blished here will
Topic :		
NPort/user	/get	
* Notification Content:		
{"msgVer":"1.0","gwlD":"N 12I/O_2647","devID":"Se msgFrame":"Hi MOXA NF	rialPort1"," <u>msgType</u> ":"Data","	
	116/1000	
* Qos : _ 0		
		OK Cancel

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

On the **PComm Terminal Emulator** page, you will receive a message from the cloud.

PComm Terminal Emulator - COM102,115200,None,8,1,RTS/CTS,Dumb Termina	
Profile Edit Port Manager Window Help	
COM102,115200,None,8,1,RTS/CTS,Dumb Terminal	- • ×
Hi MOXA NPort	<u>_</u>
DTR	
RTS	
	-
• • • • • • • • • • • • • • • • • • •	•
State:OPEN CTS DSR RI DCD Ready T>	:12 RX:13

3.3 Send the NPort's DI and DO Status to the Cloud

In this section, we will instruct you on how to trigger the DI status to the cloud. We trigger the DI status to change. We will then receive an IoT message that is the NPort's DI and DO statuses on Alibaba Cloud Console.

 Log in to NPort's web console and change **DI assess interface** to "IoT+Web+Modbus address mapping" on the **Remote I/O Access Interface** page.

-Remote I/O Access Interface





NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

2. Change **DO Status** to "ON" on the **DO Channel 0 Settings** page.

DO Channel 0 Settings

Mode	DO Status	ON Width*	OFF Width*	Pulse Count	Pulse Start
1. Current Setting					
DO 👻	ON 👻				
2. Power On Setting					
	OFF 👻				
3. Safe Status Setting					
	OFF 👻				
Apply to all					
Apply to all DO channe	els				
4. Alias Name					
Alias name of channel					
DO-00					
Alias name of "OFF" statu	IS				
OFF					
Alias name of "ON" status	5				
ON					

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

 On Alibaba Cloud, you can check the message under Device Log → Upstream Analysis. Find the latest message, and copy the MessageID. You can check the topic on Content(All), which is an Alibaba IoT Publish topic.

= 🕞 Alibaba Cloud	China (Shanghai) 🕶			Q Billing Ma	anagement More 🛕 English	0
IoT Platform	Device Log 💿					
Quick Start	Product : MOXA_NPorts	\sim				
Devices ^						
Product	Device Actitivity Analysis	TSL Data Analysis Upstream	Analysis Downstream	Analysis Mess	sage Query	
Device	Enter a DeviceName	Enter a MessageID	All	√ 1Hour	✓ Search Reset	
Group						
Rules	Time	MessageID	DeviceName	Status	Content(All) Cause	
Maintenance ^	2019/05/17 23:45:01.69	1129412514950414848	NPort	Successful	Publish me	
Real-time Monitoring	2019/05/17 23:31:50.88	2 1129409198048706048	NPort	Successful	Publish me	Con
Online Debug						Contact Us
Device Log					Total 2 Items < 1 >	
Firmware Update						
Remote Config.						
Documentation						

Select the **Message Query** tab, paste the MessageID, and click **Search**. The content of MessageID will then be shown. Under **Content**, select Raw Data to allow the NPort's message to show up.

😑 🕞 Alibaba Cloud	China (Shanghai) 🕶	Q	Billing Management More 🏠 English 👰
IoT Platform	Device Log I		
Quick Start	Product : MOXA_NPorts ~		
Devices ^			
Product	Device Actitivity Analysis TSL Data Analysis	Upstream Analysis Downstream Analysis	Message Query
Device	1129412514950414848		Search Reset
Group			
Rules	Time	Торіс	Content Raw Data 🗸
Maintenance ^	05/17/2019, 23:45:01	/Weight WNPort/user/update	{"msgVer":"1.0", "gwID":"NPortIAW5250A
Real-time Monitoring			
Online Debug			Contact Us
Device Log			ø
Firmware Update			
Remote Config.			
Documentation			

Move the cursor of your mouse over the message, and you will find the DI and DO statuses filled in JSON message. The message shows both DI-00 and DO-00 statuses as

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

true.

S	
	{"msgVer":"1.0","gwlD":"NPortlAW5250 ×
	12I/O_2647","msgType":"IO","DI00":tru e,"DI01":false,"DI02":false,"DI03":false, "DI04":false,"DI05":false,"DI06":false,"D I07":false,"D000":true,"D001":false,"D 002":false,"D003":false}
	{"msgVer":"1.0","gwID":"NPortIAW5250A

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3.4 Control NPorts' DO Status Through the Cloud

In this section, we will instruct you on how to change an NPort's DO status via the cloud. First, we use Alibaba Cloud Console to send an IoT message to the NPort's I/O topic; second, the NPort will receive an IoT message from the cloud to change the DO statuse; lastly, we will change the NPort's DO status on the web console.

1. Click **I/O JSON**.

-IoT Mode

Basic Settings	
IoT platform	Alibaba Cloud IoT Platform 👻
Alibaba Cloud IoT Platform Settings	3
Server domain (Region)	Shanghai 👻
Product key	
Device name	NPort
Device secret	CRAME CROSSES OF THE
Keep alive	60 (60 - 180 sec.)
Serial and I/O Message Format Set	tings
Serial message format	JSON -
Serial JSON message definition	Serial JSON
I/O JSON message definition	NOSL OVI
I/O publish trigger mode	Specific I/O change 👻 DI-00 👻

Copy Subscribe JSON Message:

Subscribe JSON Message						
The following DI	The following DI and DO key-values are all optional					
{						
"msgVer"	:	"1.0",				
"gwlD"	:	"NPortIAW5250A-12I/O_2647",				
"msgType"	:	"IO",				
"DO00"	:	true/false,				
"DO01"	:	true/false,				
"DO02"	:	true/false,				
"DO03"	:	true/false				
}						

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

2. The copied message has a lot of space and line feed. We can use tool to compact it. Below is a free online tool:

https://jsonformatter.org/json-minify

Paste the message in the column on the left side and change all of the DO status to false.

J	JSON Minify									
	=	≓ ≯	Sample 😽	Þ	8	~	₽	×	ረሳ	x
	1 -	3								
	2	"msgVer":"1.0",								
	3	"gwID":"NPortIAW525	0A-12I/0_264	7",						
Ι.	4	"msgType":"IO",	_							
	5	"DO00":false,								
	6	"DO01":false,								
	7	"DO02":false,								
	8	"DO03":false								
	9	}								

Click **Minify JSON**. It will show a compact JSON format message in the column on the right. Click **Copy to Clipboard**.

JSON Minify		
Sample ↔ B A → B X ② X 1 * [6] 2 "segVer"."1.0", 3 "gvID":"NPortIAW5250A-121/0_2647", 4 "msgType":"IO", 5 "DOOB":false, 6 "DOOB":false, 7 "DOOB":false, 8 "DOOB":false 9]	Load Data Minify JSON Format JSON	
Paste it	Download	

NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

3. On Alibaba Cloud, click **Publish** next to the **Subscribe** topic.

😑 🕞 Alibaba Cloud	China (Shanghai) 🔻		Q Billing Management More 雄 English 🌔
IoT Platform	Devices > Device Details		
Quick Start	NPort Online Product : MOXA_NPorts View ProductKey : : : : : : : : : : : : : : : : : : :	Сору	DeviceSecret : ******* Show
Devices ^	Device Information Topic List Status Events	Invoke Service	Device Shadow Manage Files Device Log
Device	Device Topic List 💿		
Rules	Device Topic	Device Authorizations:	Published Octions Octions
Maintenance ^	/sys/arta://arta/sys/Port/thing/model/up_raw	Publish	
Online Debug	/sys/and/action/NPort/thing/model/down_raw	Subscribe	
Device Log	http://www.update	Publish	1 Publish
Firmware Update Remote Config.		Publish	0 Publish
Documentation	neTIngSu/NPort/user/get	Subscribe	0 Publish

To publish a topic to NPort's I/O: on the **Publish** window, paste the clipboard message in the big text area, select **1** under **QoS**, and click **OK**.

 Exercise caution if this topic is being used. The messages published here will not be subscribed by the server. Topic : u/NPort/user/get Notification Content: ["msqVer":"1.0", "gwID": "NPortIAW5250A-12I/O_2647", "msgType": "IO", "DO00":false, "DO01":false, "DO02":false, "DO03":false}]
 Notification Content: {"msgVer":"1.0","gwlD":"NPortIAW5250A- 12I/O_2647","msgType":"IO","DO00":false,"DO01":fals e,"DO02":false,"DO03":false}
 Notification Content: {"msgVer":"1.0","gwlD":"NPortIAW5250A- 12I/O_2647","msgType":"IO","DO00":false,"DO01":fals e,"DO02":false,"DO03":false}
Content: {"msgVer":"1.0","gwID":"NPortIAW5250A- 12I/O_2647","msgType":"IO","DO00":false,"DO01":fals e,"DO02":false,"DO03":false}
{"msgVer":"1.0","gwlD":"NPortlAW5250A- 12I/O_2647","msgType":"IO","DO00":false,"DO01":fals e,"DO02":false,"DO03":false}
117/1000
* Qos : 0
OK Cancel



NPort IA5000A-I/O or NPort IAW5000A-I/O to Mosquitto Alibaba

On the NPort's web console, check DO-00 status as OFF.

DO Channel Settings

DO Channel	Mode	Status	ON Width	OFF Width
DO-00	DO	OFF		
DO-01	DO	OFF		
DO-02	DO	OFF		
DO-03	DO	OFF		

You can also find new MessageID under Upstream Analysis on Alibaba Cloud, because we connect DO-00 to DI-00. The new message shows both DI-00 and DO-00 statuses as false.

sis	Messane Query
	{"msgVer":"1.0","gwID":"NPortIAW5250 ×
	12I/O_2647","msgType":"IO","DI00":fal se,"DI01":false,"DI02":false,"DI03":false
	,"Dl04":false,"Dl05":false,"Dl06":false," Dl07":false," <u>DO00":false</u> ,"DO01":false,
	"DO02":false,"DO03":false}
	{"msgVer":"1.0","gwID":"NPortIAW5250A