

USR-N5X0 Quick Start Guide with AWS IoT



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1. AWS IoT

USR-N5X0 supports connecting to AWS IoT platform via MQTT, which can be achieved via simple MQTT and SSL parameter configuration.

1.1. Basic Parameters

- MQTT Version: Supports MQTT-3.1 and MQTT 3.1.1.
- Client ID: MQTT client identifier.
- Server Address: MQTT server domain name or IP address.
- Remote Port NO.: MQTT server port.
- Reconnection Internal: The interval between the current connection failure and the next MQTT connection.
- Last Will: MQTT connection flag. When the network connection is closed, the server must publish this will message.
- SSL protocol: Supports TLS1.0 and TLS1.2 versions, and the authentication mode can choose none certificate authentication, CA signed server and self signed certificate.

1.2. Publish Settings

- Topic: Publish topic name.
- QOS: Message quality of published topics.
- Retailed message: MQTT retains the message flag, which is used by the server to store this application message and its quality of service (QoS).

1.3. Subscribe Settings

- Topic: Subscribe topics.
- QOS: Message quality of subscribed topics.

2. AWS Connection Test

In this case, we will show how to connect USR-N5X0 to AWS.

2.1. Preparations

- USR-N5X0*1
- RS485 serial to USB cable*1
- Ethernet cable*1



• 12V/1A power adaptor*1

2.2. Configuration of AWS

2.2.1. Login

- 1. Login https://www.amazonaws.cn/en/
- 2. Login to the account. If you do not have an account, please create one firstly.

Sign in as IAM user	
Account ID (12 digits) or account alias	
IAM user name	
Password Forgot password?	
Remember this account	
Sign in	督能的威胁位测和持续的女主监控
New to Amazon Web Services?	了解更多
Create a new Amazon Web Services account	

3. Find IoT Core in Internet of Things.





2.2.2. Create Things and Certificates

Monitor	Things (18) Info An IoT thing is a representation and reco needs a thing record in order to work wit	C Advanced search Run aggregation	ons Edit Delete Create
Connect	Q Filter things by: name, type, gr	oup, billing, or searchable attribute.	< 1
 Connect many devices 	Name	Thing type	
	USR-M300	type_none	
Test	410s_RT_H7_2		
Pigri test client	П М100-Т		
Manage	USR-M100	type_none	
▼ All devices	USR-M100-PUSR	-	
Things	510-sgb-test	-	
Thing groups	□ 540-4-test	type_none	
Fleet metrics	W610test		
Greengrass devices	1064-1		

1. In **Manage->All devices->Things**, click **Create things** to add the device.

2. Choose **Create signal thing**, fill in the **Thing name** and **Thing type**, here we configure the thing name to "USR-N5X0-Test", configure the thing type to "type_none".

res es.	ource is a vigical representation of a physical device of togical entry in Anazon for Four device of entry needs a ource in the registry to use Amazon IoT features such as Device Shadows, events, jobs, and device management
ın	iber of things to create
0	Create single thing
0	Create single thing Create a thing resource to register a device. Provision the certificate and policy necessary to allow the device to connect to Amazon IoT.
•	Create single thing Create a thing resource to register a device. Provision the certificate and policy necessary to allow the device to connect to Amazon IoT. Create many things



specify thing properties	A thing resource is a digital representation of a physical device or logical entity in AWS IoT. Your device or entity needs a
Step 2 - <i>optional</i> Configure device certificate	resource in the registry to use AWS IoT features such as Device Shadows, events, jobs, and device management features.
Step 3 - optional	Thing properties Info
Attach policies to certificate	Thing name
	USR-N5X0-Test
	Enter a unique name containing only: letters, numbers, hyphens, colons, or underscores. A thing name can't contain any spaces.
	Additional configurations
	You can use these configurations to add detail that can help you to organize, manage, and search your things.
	▼ Thing type - optional
	ining types are an optional way to store description and configuration information that is common to things that have the same thing type.
	type_none Clear Create thing type
	Add searchable attributes to allow your thing to be grouped and searched without using fleet indexing.
	No searchable attributes are associated with the selected thing type.
	Add new attribute
	No searchable attributes are associated with the selected thing type.
	Add new attribute
	Non-searchable thing attributes optional
	This secure control
	Ining groups - optional
	Bitting group - optional
	Packages and versions - optional
	Device Shadows Info Device Shadows allow connected devices to sync states with Amazon Web Services. You can also get, update, or delete the state information of this thing's shadow using either HTTPs or MQTT topics.
	• No shadow
	 Named shadow Create multiple shadows with different names to manage access to properties, and logically group
	your devices properties. O Unnamed shadow (classic)

Next, choose **Auto-generate a new certificate**, you can also choose others if you have your own certificates. 3. Then click **Next**.



Specify thing properties Step 2 - optional Configure device certificate	CONTIGUITE CLEVICE CERTIFICATE – OPTIONAL Info A device requires a certificate to connect to Amazon IoT. You can choose how to register a certificate for your device now, or you can create and register a certificate for your device later. Your device won't be able to connect to Amazon IoT until it has an active certificate with an appropriate policy.
Step 3 - <i>optional</i> Attach policies to certificate	Device certificate
	• Auto-generate a new certificate (recommended) Generate a certificate, public key, and private key using Amazon IoT's certificate authority.
	O Use my certificate Use a certificate signed by your own certificate authority.
	O Upload CSR Register your CA and use your own certificates on one or many devices.
	 Skip creating a certificate at this time You can create a certificate for this thing and attach a policy to the certificate at a later time.
	Cancel Previous Next

4. Do not create policies, directly click **Create thing.** Then it will show the certificates interface. Download the

certificate and key files, then click **Done** to back to the things interface.

ecify thing properties	Attach policies to certificate - optional info Amazon IoT policies grant or deny access to Amazon IoT resources. Attaching policies to the device certificate applies this
tep 2 - optional	access to the device.
onfigure device certificate	
	Policies (21) Create policy 🖾
Attach policies to certificate	Select up to 10 policies to attach to this certificate.
	Q. Filter policies
	Name
	sgb-default
	peng-test
	new
	_ myh_510
	aws_test_strategy
	W610test
	USR-N510
	USR-M300
	USR-M100
	USR-M00-PUSR
	N540-Test
	□ N510-AWS
	Cancel Previous Create thing

Download certificate and key f Amazon Web Services.	files to install on your device so that	it can connect to
Device certificate You can activate the certificate now Amazon IoT.	r, or later. The certificate must be active fo	or a device to connect to
Device certificate o5160b9bfa2te.pem.crt	Deactivate certificate	🕑 Download
he key files are unique to this cert bownload them now and save then This is the only time yo	ificate and can't be downloaded after you n in a secure place. u can download the key files for this	leave this page. s certificate.
^p ublic key file 5160b9bfa2e472c6b63bea	0592a85-public.pem.key	🕑 Download
Private key file 55160b9bfa2e472c6b63bea	592a85-private.pem.key	Download
Root CA certificates Download the root CA certificate fil you're using. You can also downloai	e that corresponds to the type of data end d the root CA certificates later.	dpoint and cipher suite
Amazon trust services endpoir RSA 2048 bit key: Amazon Roo	nt ot CA 1	Download
Amazon trust services endpoir ECC 256 bit key: Amazon Root	nt CA 3	☑ Download
	rtificate that you need here, Amazor	n loT supports

2.2.3. Create Policies

1. In Manage->Security->Policies interface, click Create policy.

Test	Amazon IoT > Security > Policies	
MQTT test client	Amazon IoT policies (21) Info	lete Create policy
Manage	Amazon IoT policies allow you to control access to the Amazon IoT Core data plane operations. Amazon IoT policies are separate and different from IAM policies. Amazon Io IoT data plane operations.	T policies apply only to Amazon
All devices Greengrass devices	Q Find policies	< 1 > 🔘
Software packages New	Policy name	•
Remote actions	U W610test	
Retained messages	USR-N510	
▼ Security	□ USR -M300	
Intro	USR-M100	
Policies	USR-M00-PUSR	
Certificate authorities	sgb-default	
Role aliases Authorizers	peng-test	
 Audit 	пеж	
Detect	N540-Test	
	N510-AWS	

- 2. Fill in the **Policy name**, add new statement in **Policy document**. There is a default statement which can be directly operated.
- 3. Add 4 policies: iot:Connect, iot:Publish, iot:Receive, iot:Subscribe.
- Policy resource format: arn:aws:iot:region:AWS-account-ID:Resource-type/Resource-name, AWS-account-ID is your account ID of AWS.
- 5. Then click **Create** to create the policies.



Create policy Info

Policy properties WS IoT Core supports named pol	cies so that many identities can refer	rence the same policy document.				
olicy name						
USR-N5X0-Test						
policy name is an alphanumeric	tring that can also contain period (.),	, comma (,), hyphen(-), underscore (_), plus sign (+), equal sign (=),	and at sign (@) characters, but no spaces.		
Tags - optional						
Policy statements Policy Policy document Info In Amazon IoT policy contains one 'olicy effect	y examples or more policy statements. Each poli Pr	icy statement contains actions, resound	urces, and an effect that grants	or denies the actions by the resources. Policy resource		Builder JSC
Policy statements Policy Policy document Info In Amazon IoT policy contains one colicy, effect Allow	or more policy statements. Each poli P. I	icy statement contains actions, reso olicy, action iot:Connect	urces, and an effect that grants	or denies the actions by the resources. Policy resource am:awsiot:cn-north-1:944284229783;client/*	Remove	Builder JSC
Policy statements Policy Policy document Info In Amazon IoT policy contains one tolicy, effect Allow Allow	or more policy statements. Each poli P C C C C C C C C C C C C C	icy statement contains actions, reso olicy, action iot:Connect iot:Publish	urces, and an effect that grants	or denies the actions by the resources. Policy resource am:aws:iot:cn-north-1:944284229783:client/* am:aws:iot:cn-north-1:944284229783:topic/*	Remove	Builder JSC
Policy statements Police Policy document Info Info Info Info Policy effect Allow Allow Allow	or more policy statements. Each poli Picture Picture	icy statement contains actions, reso olicy, action iot:Connect iot:Publish iot:Receive	urces, and an effect that grants	or denies the actions by the resources. Policy resource am:aws:iot:cn-north-1:944284229783:client/* am:aws:iot:cn-north-1:944284229783:topic/* am:aws:iot:cn-north-1:944284229783:topic/*	Remove Remove Remove	Builder JSC

2.2.4. Attach Polices to Certificate

1. We have bound certificate and the thing when creating the device, so we can directly find the device in

Manage->All devices->Things, click Certificates in USR-N5X0-Test.

	AWS IOT > Manage > Things > USR-NSX0-Test		
Connect Connect one device	USR-N5X0-Test Info	Create secure tunnel	Edit Delete
Connect many devices	Thing details		
Test ▶ Device Advisor MQTT test client Device Location	Name Type USR-NSX0-Test type_none ARN Billing group amaxsicthing/USR-N5X0-Test		
Manage All devices Things	Attributes Certificates Thing groups Device Shadows Activity Packages and versions Jobs Alarms Defender metrics		
Thing groups Thing types Fleet metrics	Certificates (1) Info The device certificates attached to this thing resource.	C Detach	Create certificate
Greengrass devices	Q, Find certificates		< 1 > 💿
LPWAN devices Software packages New	Certificate ID Status		▽
Remote actions	□ b: 60d ⊘ Active		

2. Find **Polices** under certificate, click **Attach policies**, choose the polices you have created.

Policies Things Noncompliance	
Policies (0) Info Amazon IoT policies allow you to control access to the Amazon IoT Core data plane operations.	C Detach policies Attach policies
Name	▼
No policies You don't have any policies attached to this cer	tificate.



bacfl 0b8 160d.	09522
Policies Choose policies to attach to this certificate. The	e certificate can have up to 10 policies attached to it.
CL AND LT L	- 0
Choose AWS IoT policy USR-N5X0-Test X	▼ C

2.2.5. Obtain Product Information

1. Client ID is the Things name of the device, you can find the device name in **Manage->All devices->Devices**.



2. Find the server domain address that N5X0 device needs to connect in **Settings**, port defaults to **8883**.

MQTT test client	Amazon loT > Settings			
Manage All devices	Logging now supports JSON logs and fine-g By upgrading, logging has four levels of log ve	rained control. rbosity and roles can be specific at the a	account-level.	Upgrade
Things Thing groups	Settings Info			
Fleet metrics	Device data endpoint Info			C
 Greengrass devices 	Your devices can use your account's device data endpoint to o	onnect to Amazon Web Services.		
Software packages New				
Remote actions	Each of your things has a REST API available at this e	ndpoint. MQTT clients and Amazon IoT	Device SDKs 🔀 also use this endp	point.
Message routing	Endpoint			
Retained messages	awwis0u7xuagf.ats.iot.cn-north-1.amazonaws.co	m.cn		
Security				
Device software	Domain configurations Info	is ministing devices to Amazon IoT Core minist	Acti	ons Create domain configuration Create domain configuration
Billing groups	To can create domain comgarations to simplify tasks such	s mighting devices to Amazon for core, migh	and application intestructure to Anaze	short core and maintaining brand identity.
Settings	Name Domain name	Status	Service type	Date updated
Feature spotlight		Ne domain confi	in un thin and	
Documentation 🖸	•	You don't have any doma	ain configurations.	

2.3. Device Configuration

- 1. Enable AWS IoT Service.
- 2. Configure the Client ID, Remote port 8883 and Server address.
- 3. Add the SSL certificates, configure the SSL protocol to TLS1.2, Verify All. Upload the RootCA1.pem, certificate.pem.crt and private.pem.key files.



Communication Expert of Industrial IoT		
✓ Status	Basic configuration Publish Subscribe	
Overview		
> Network	Enable Service Enable	
> Port	Client ID USR-N5X0-Test	
✓ Gateway		
MQTT Gateway	Server Address (IP) awwis0u7xuagf ats.iot.cn-north-1	
Edge Computing	Server Port NO. 8883 (1~65535)	
✓ Cloud Service	Keepalive Interval 60 (30~1200)s	
USR Cloud		
Alibaba Cloud	Reconnecting time Without Data 0 (0~65535)s	
AWS IoT	Reconnection Interval 5 (1~65535)s	
✓ System	Clean session	
System Setting	Viette and Charles	
Management	Verily All	
log	Upload Server CA Server Root CA Choose file Upload	
Log	Upioaded certificate: AmazonkootCA i (z).pem	
	Upload Client CA Chient CA Choose file Upload Uploaded certificate: 78daf09- daee8c	
	e97 vd60d-certificate.pem.crt	
	Upload Client Private Key Client Private Key Choose file Upload	
	Uploaded certificate: b: vee8c)d-private.pem.key	
	Save&Apply	
	linan USR IOT Technology Limited http://www.nuer.com	
	Sindi our for feelinology Linited. http://www.pusi.com	

4. After above configurations, click **Save&Apply** to take the parameters effect.

2.4. Data Transmission Test

2.4.1. Transparent Transmission

After configuring the MQTT server parameters, click "Continue" to configure the topics. Enable Publish topic1 in Publish, configure the publish topic in topic string.

Custom mode Disable	~ U	
Publish topic1 🔽		
Transmission Mode	Transparent transmission	~ @
Topic String	/PubTopic1	
Binding port	Port 1,	
QOS	QOS0	~
Retained message		
Publish topic2		



Subscribe to	ppic1 🗹		
	Transmission Mode	Without Topic	~ <mark>0</mark>
	Topic String	/SubTopic1	
	Binding port	Port 1,	
	QOS	QOS0	~

2. Enable **Subscribe topic1** in **Subscribe**, configure the subscribe topic in topic string.

3. Also need to configure the serial parameters of USR-N5X0 device to be consistent with your serial RS232/RS485 device.

USR IOT Communication Expert of Industrial IoT				
✓ Status				
Overview	ART TO ETH			
> Network	ta transmission parameter con	figuration		
✓ Port SE	TTING			
Port1 Po	rt Socket			
Websocket to Serial				
> Gateway	Baud rate	115200		(600~921600)bps
Cloud Service	Data bits	8	~	bit
✓ System		L		
System Setting	Parity	None	~	
Management	Stop bits	1	~	
Log	Flow ctrl	NONE	~	
	UART Packet Length	0		(0~1460)bytes
	UART Packet Time	0		(0~255)ms
	Sync Baudrate(RFC2217)	ON	~	
	Enable Uart Heartbeat			
				Save&App

4. Here we connect the RS485 port of N5X0 to the PC via an RS485 to USB cable. After the MQTT connection is established, we can achieve the data transmission between AWS and N5X0 serial port.

	C Enter the topic name	🐨 - 🖉 ComUart Assistant 🙀 - 🗆 🛪
AWS IOT	Message payload	COM Settings Data receive SAVAGE V4.2.1
Monitor	{ "message": "Hello from AWS IoT console")	Penting 100/20 = Bandr 11/200 = DPay 14/00 =
Connect Connect one device Connect many devices	Additional configuration Publish	Devel 10 mm Step6 1 m Cone There Options
Test Device Advisor 	Subscriptions /PubTopic1	□ Receive to file □ Must District □ State timetree □ State timetree □ These receive as hose □ Press receive
MQTT test client Device Location New	/PubTopic1 🗢 🗙 Message payload	Santa Class Sand Optimar These for a file
Manage	"message": "Hello from AWS loT o }	nsole"
All devices	Additional configuration	Period 1000 ms data from serial port Send
 Greengrass devices LPWAN devices 	Publish	1258 1.1657 167 Ready! Send: 42 Recor: 0 Recet
Software packages New		
 Remote actions Message routing 	▼ /PubTopic1	April 26, 2024, 15:25:08 (UTC+0800)
Retained messages		
 Security Fleet Hub 	Message cannot be displ	yed in specificatempat.
Device software Billing groups	data from serial port	
Settings	► Properties	

Subscribe to a topic Publish to a topic	
Topic name The topic name identifies the message. The message payload will be published to this topic with a Quality of Service (Qo5) of 0. Q /SubTopic1 Message payload	CONTURENT Assessment Conturent Assessment Conturent Assessment Conture assess Conture assessment Conture asses Conture assessment Conture as
{ "message": "Hello from AWS IoT console" } Additional configuration Publish	StopB Beer Options Beerive to file V Anto linefeed Show tinestemp Beceive as hes
Subscriptions /PubTopic1 /PubTopic1 Image: Message payload { { message*: "Hello from AWS IoT console" } }	Sarz Clasz Sand Option Data from file Auto checkum Pariod [1000 ms locd Clasz Sand Sarbox Data from serial port Sarbox
Additional configuration Publish V/PubTopic1	الع العدي 19 العدي 19 معدي 19 العدي 19 معدي 19 العدي 19 معدي 19 العدي 19 الع 19 العدي 19 الع 19 العدي 19 ا

2.4.2. Edge Computing

1. Enable Edge Computing function.



USR IOT Communication Expert of Industrial IoT	
 ✓ Status Overview > Network 	Edge Computing Gateway Including edge acquisition, edge computing, edge reporting and other functions, supports Modbus RTU to Json, Modbus RTU to Modbus TCP and other general industria
Port Gateway MQTT Gateway	SETTING Edge Computing Data Acquisition Data Query and Report
Edge Computing Cloud Service System	Enable Edge Computing Enable
System Setting Management Log	

2. Add a Modbus RTU slave device, configure the Modbus registers that you need to read. Click **Next**.

age company cate requiring cate door, and report					
lect edge computing profile Choose file Export					last: 126 node
No. Name†↓ Port†↓ Slave addr†↓ Operations	No.	Name†↓	Register address†↓	Data type†↓	Operations
device01 Port1 1 Edit Delete	1	node0101	40001	uint16	Edit Delete
	2	node0102	40002	uint16	Edit Delete
400 Siave			Add node	ŝ	

3. Select the socket type to **AWS IoT**, enable **Data Query** and **Reporting method**. Configure the parameters according to your needs. Please do not enable **Retained Message** when connecting to AWS.



Socket type	AWS IoT	× @	
ery			
Data Query	Enable	•	
Query type	Json	~	
Query Topic	/QueryTopic		
QOS	QOS0	Y	
Report Topic	/UploadTopic		
QOS	QOS0 ·	~	
Retained Message			
Report of nodes			
Reporting method	E-14	99	1
	Enable	~	
Periodic reporting		~	
Periodic reporting Reporting interval	Enable	✓ (1~36000)s	
Periodic reporting Reporting interval Reporting on regular	5 (Start NTP first)	✔ (1~36000)s	
Periodic reporting Reporting interval Reporting on regular Failure Padding	C (Start NTP first)	✔ (1~36000)s	
Periodic reporting Reporting interval Reporting on regular Failure Padding Quotation Mark	C S S (Start NTP first)	✔ (1~36000)s	

- 4. After configuring all the parameters, restart the device to take the parameters effect.
- 5. In this test, we use Modbus Slave software to simulate a serial sensor. After N5X0 device read the

temperature and humidity data from serial port, it will convert to JSON format and send to AWS platform.

/UploadTopic			
/ optoad topic			
Additional configuration			
P Additional configuration		and the second state of the	
Subccribo		a: Modbus Slave - [Mbslave1]	- u ×
Subscribe		Eile Edit Connection Setup Display View Window Help	- 8
ubscriptions	/UploadTopic	Alias 00000	
		0 25	
/UploadTopic 🗘 🗙	Management	1 67	
	Message paytoau	2	
	£	3	
	"message": "Hello from AWS IoT console"	4	
	}	5	
		6	
	Additional configuration	7	
	- New York Control of	8	
	Publish	9	
	▼ /UploadTopic		
	{		
	"Temperature": 25,		
	"Humidity": 67		
	}		
	Properties		
		For Union array F1	Dent 30, 115300 0 N 1







Official Website: www.pusr.com Official Shop: shop.usriot.com Technical Support: h.usriot.com Inquiry Email: inquiry@usriot.com Skype & WhatsApp: +86 13405313834 Click to view more: Product Catalog & Facebook & Youtube