How to Connect your Industrial Assets to Microsoft Azure IoT Hub using N3uron's MQTT Module



Connecting Azure IoT: Overview

As stated in our previous article, <u>MQTT: The Universal Messaging Protocol for Cloud Providers and IIoT Systems</u>, MQTT has emerged as the defacto standard for IIoT and of course, is also supported by Microsoft Azure.

OT infrastructures can be connected to Azure IoT Hub using MQTTT, enabling access to the entire ecosystem of services currently provided by Microsoft Azure and for instance, making it very easy to ingest real-time data in Stream Analytics and subsequently perform actions or send alarms using Event Hubs or Azure Functions. In short, Azure IoT Hub is the service that receives and routes MQTT messages from edge devices and applications such as N3uron.

This guide explains in detail how to communicate your industrial assets bi-directionally with Azure IoT Hub in a secure way through N3uron's MQTT module and thus, bridge the gap between OT and IT.



Diagram showing operational data flow between Azure IoT Hub and N3uron IIoT platform.

Azure IoT Hub and N3uron Requirements

It is assumed that you already have an Azure subscription. If not, you can create one at <u>https://azure.microsoft.</u> <u>com/en-us/free/search/</u>.

If you haven't downloaded N3uron yet, you can do so at <u>https://n3uron.com/downloads/</u>. If this is the first time you are installing N3uron, our <u>Quick User Guide</u> will guide you through the entire installation process.

You will also need access to Azure IoT Explorer, a graphical tool for interacting with all devices connected to your IoT hub. Go to <u>Azure IoT explorer releases</u> and expand the list of assets to see the most recent release. Download and install the most recent version of the application.

Setting up an Azure IoT Hub

Creating a new IoT Hub

- Step 01: Log into Microsoft Azure and go to the Azure Portal. Click on the link to get to the Microsoft Azure Port.

N₃uron

Microsoft Azure	P Busc	r recursos, servicios y documentos (G+/)		N 8	L O O Z josegranero@n3u
					DEPAGE OF
	Servicios de Azure				
	+ 💉	🐺 🕲 🚍	3		
	Crear un Centro de recurso inicio rápido	Máquinas App Services Cuentas di virtuales almacenamie	e SQL Database Azure enti Cosmos DB	Servicios de Aplicación de Más servici Kubernetes funciones	01
	Recursos recientes				
	Nombre	Tipe		Última consulta	
	X CS-NOTHUD	Cen	tro de loT	hace 4 semanas	
	10.000				
	Navegar				
	📍 Suscripciones	Grupos de recursos	Todos los recursos	Panel Panel	
	Herramientas				
	Minneth Laser of	Anna Manitar	Canada Canada	Administratión de postes	
	Aprenda a usar Azure con	Supervise las aplicaciones y la infraestructura	Proteja sus aplicaciones e	Analice y optimice el gasto en la nube de forma gratuita	
	de Microsoft.				
	Vínculos útiles			Aplicación móvil de Azure	
	Documentación técnica (5ª Herramientas de micración de Azure	Servicios de Azure (5ª Buscar un experto de Azure	Actualizaciones recientes de Azure (3ª Centro de inicio rápido	App Store	

Screenshot displaying Azure portal tools panel.

Once logged in, you'll need to create the Azure resources that your device, in our case a **N3uron** node, will require in order to connect to the Azure IoT Hub and start exchanging messages.

- Step 02: From the Azure homepage, select the + Create a resource option and then enter IoT Hub in the Search the Marketplace field.
- Step 03: Select IoT Hub from the search results and then select Create.

Microsoft Anure		D. Search resources are	names, and doors (S+A			jose.granero@n3un	
inne 3 Create a resource 3 Made	atolana h	C-Electroliterenter	11466 814 824 28 10			DUAUD DI	RECTORY
oT Hub &							
hermoft							
Let Unit							
	QF Add to Favorites						
* 4.2 (349 Azure	rating()						
Create							
Overview Plans Usage Infor	mation + Support Reviews						
Simultaneously support millions of co	onnected devices-whether they run W	indows. Linux. or real-time operating syste	ems. Then monitor performance and s	ind commands to			
accelerate your digital transformation	n						
Media							
124 Mar 124							
And	*[1007.c.						
	•10000						
	*janilo.						
	· · · · · · · · · · · · · · · · · · ·						
	T T T T T T T T T T T T T T T T T T T						
And products from Microsoft	• • parties			See 21			
More products from Microsoft		۵		54.87			
More products from Microsoft	* Finite Contemporate Contempor	🐼 Azure VMniare Solution	API App	See 28			
More products from Microsoft	*Jamin.	Azure VMmare Solution	All Ago	Seedi			
More products from Microsoft Wester Update for IoT Hub Norset Desire Update for IoT Hub Norset Desire Update for IoT Hub	* Jacobia Treat Door Sandad/Prenium Mossoft Mossoft	Azure VMware Solution Moosoft	An App Mooseft	See All			
More products from Microsoft	* * Food Door Food Door Sundad/Previum Mosoft Aus foot Sove Aus foot Sove Aus foot Sove	C Agure VMware Solution Mouse Mouse Ague VMware Solution (20)	APT App Moreaut Alaus knite Salava KETU Alfr on anterpris	54.87			
More products from Microsoft	*Jonet Boor Sundard/Previous Mosselt Austers two: Austers	Contract Solution Monorth Appr Kinese Appr Viteme Solution (201) controlment Solution (201) controlment Solution (201) controlment Solution (201)	An App Mossift Aars two: external, under some someting ander autruit, under some someting ander autruit, under some someting ander autruit.	See Al			
More products from Microsoft	*James Front Door SundardPennion Moreost Alars Social Alar Social Alar Social Alar Social	Control Viterate Solution Monute Viterate Solution Mars Sense Autor Sonare Solutions Solutions Solutions Solutions Solutions Solution Solution Solutions	API App Moself Aber Senter Issues (Sty, Ab examples processing), and a complete processing and a complete processing.	See AT			
More products from Microsoft Weight States Device Update for Inf Hub Amsont Amsont Barry and Tainy update part minimis with Device parts More for Informations Microsoft Barry and Tainy update part minimis with Device parts More for Informations Microsoft Barry and Tainy update part Microsoft	*James Foot Door Sundad/Penium Morsoft Mars Save Rans Save R	Contract Solution Moreon Approximation Approximate Approximate Solution (202) common the Marker Solution Solution (202)	API App Molecult acceler 40% And emergence acceler 40% And emergence acceler 40% acceleration and and 50% generation	Seeda			
More products from Microsoft	Coster v	Agure VMeare Solution Mosent Mosent More Solution (Md) comments (Mare Solution More Solution (Md) comments (Mare Solution More Solution More Solution	An App Mosel Mars twice and Staff with an analysis grade works, may a cost antibility and an Staff pression	54.87			
Accession of the second	*Jean Construction Sundard/Previous Mouse Mouse Marce for Sundard/Previous Mouse Mouse Previous Previous Mouse Mou	Create V	Ereate V	See Al			
More products from Microsoft Device Update for IoT nub Konsult Response Transformation pro- noses with Device Update for IoT nub Konsult Response Transformation pro- noses with Device Update for IoT Nub	*Joint Door Sundard/Previous Moved: Ages from Subsect Francisco Moved: Ages from Subsect Francisco Ages from Subse	Create ~	Arr A rep Microsoft Marc Shore profession of Shore memory in profession of Shore memory in a sub Shore profession Creatife V	See al			
More products from Microsoft Device Update for IdT Tub Microsoft Device Update for IdT Tub Microsoft Micr	*Jamin Front Door Sundard/Pension Moresoft Aust House Coster v	Create V	API App MoseAf Asire Strike Instruction of the energies presented to presented and and Strippension Create v	See AT			
More products from Microsoft Microsoft Mansoft	Coster C	Create ~	An App Model Mars Service area with white an energies great with white an energies are an Sticgneetice Create V	54.87			

Screenshot displaying how to create a hub within the Azure IoT Hub.

- Step 04: In the Basics tab, complete the fields as follows:
 - **Subscription:** Select the subscription to use for your hub. In this example, we have selected Azure subscription 1.
 - Resource Group: Select a resource group or create a new one. To create a new one, select Create new and fill in the name you want to use. To use an existing resource group, select the specific resource group. For more information, see <u>Manage Azure Resource Manager resource groups</u>. In this example, we have selected CS_N3uron.
 - Region: Select the region you want your hub to be located in. Select the location closest to you.
 - IoT Hub Name: Enter a name for your hub. In this example, we have named it N3-IoT.



Screenshot displaying Azure IoT Hub details panel.

- Step 05: Select Next: Networking to continue creating your hub. Choose the endpoints that the devices can use to connect to your IoT Hub and select the Public access default setting.

		https://	/azure.microsoft.com	C	<u> </u>
Microsoft Azure		P Search resources, services, and docs (0+7)		5 6 4 0 O	
Home > Create a resource > Mark IOT hub Monsoft	stoface > loT Hub >				×
Basics Networking Manage	ment Tags Review + create				
You can connect to your IoT hub eith	er publicly via its public hostname or privately us	ng a private endpoint.			
Correctively configuration *	 Public access Photos access, Recommended. The access access	conactively wellood after this resource has been constell.			
Review + cmate + Previe	vsi Basics Next: Management >				

Screenshot displaying Azure IoT Hub networking panel.

- Step 06: Select Next: Management to continue creating your hub Accept the default settings here.
- Step 07: Select Next: Tags to continue to the next screen. Accept the default settings here.
- Step 08: Select Next: Review + create to review your choices. You should see something similar to this
 screen but with the values you selected when creating the hub.
- Step 09: Select Create to start the deployment of your new hub. Your deployment will remain in progress
 for a few minutes while the hub is being created. Once the deployment is complete, select Go to resource
 to open the new hub.

Microsoft Anus		D. Saadh menunan sanine and don Ma A	5 5 0 0 0	g josegranero@nturon.c.
- Microsoft Azure		2 ¹ Second resources, services, and docs (4 ⁺))		DRIAULT DIRECTORY
fome > Create a resource > Ma	roetplace > foil Hub >			
Acrosoft				~
🛇 Validation passed.				
Parties Makandran Mana	and the Balance state			
oasics networking manag	ement ugs Review + create			
Basics				
Subscription	Azure subscription 1			
Resource group	CS_N3uren			
Région	West Europe			
ioT hub name	N3+IoT			
Networking				
Connectivity configuration	Public access			
Private endpoint connections	None			
Allow public network access	Enabled			
Management				
Hicing and scale tier	\$1			
Number of \$1 107 hub units	1			
Messages per day	400,000			
Device-to-cloud partitions	4			
Defender for IoT	See the Defender for IoT proving			
Preview mode	Off			
Tags				
Create · Previous Tan	Next > Automation antions			

Screenshot displaying validation passed confirmation in Azure IoT Hub.

Configuring Your Shared Access Policy

You can choose between two different mechanisms provided by Azure IoT Hub to authenticate devices and services: **Security Tokens** and **X.509 Certificates**. In this example, we are going to use **Security Tokens**. These **Security Tokens** are also known as Shared Access Signature (SAS) tokens. For more details about configuration using **X.509 Certificates**, please visit our <u>Knowledge Base</u>.

- Step 01: In the resource panel of the IoT Hub you have just created, select Shared access policies.
- Step 02: Click on iothubowner and copy the Primary connection string from the right-hand panel.

Microsoft Azure		(J) Search resources, services, and docs (0+/)	ы 🗣 🖉 Ф А	jose.granero@n3uron.c.
Home > N3-IoT-12916812 > N3-Io	т		iothubowner	×
+ N3-IoT Shared a	ccess policies 🔌 –		N2-IeT	
67.866			Regenerate primary key Regenerate secondary	rkey 11 Swap keys
,P Search (Ctrl+/)	4 Shared access policies may be used 	to generate security tokens to consume to? hub functionality. Learn more	Primary key	
R Overview	Connect using shared access polic	es		• 0
Activity log	Ed Sizer 7 Discord change		Secondary key	
Access control (IAM)	Idea -			0
Tags	Deny		Primary connection string	
Diagnose and solve problems	and the second second			
Events	Manage shared access policies		Secondary connection string	
Pricing and scale	+ Add shared access policy ()	Refresh (B) Delete		
Device management	Policy Name	Permissions	Permissions	
B Devices			Registry Read	
🛆 lof Edge	vothubowner	Registry Read, Registry Write, Service Connect, Device Connect	Registry Write	
R Configurations	service	Service Connect	Service Connect	
Updates	device	Device Connect	Device Connect	
Duenes	and the second second	Residue Read		
Hub settings	registyneso	neproy new		
 Built-in endpoints 	registryReadWille	Registry Read, Registry Write		
🔽 Message routing	test	Registry Read, Registry Write, Service Connect, Device Connect		
Rie upload				
-> Fallover				
T Properties				
🔒 Locks				
Security settings				
💲 identity				
📍 Shared access policies				
63 Networking				
Certificates				
Defender for IoT				
0.00000				
A AND DESIGN				
			Update Permissione Cancel	

Screenshot displaying the shared access policies panel in Azure IoT Hub.

- Step 03: Start the Azure IoT Explorer, click on the + Add connection button, and paste the Primary connection string in the Connection String text box. Next click Save.



Screenshot displaying Azure IoT Explorer Graphical Tool interface.

Step 04: In the Devices section, click on the +New button and enter a name for your device. In this example, we have named it "N3uron_Gateway". In Authentication type, select Symmetric key, check the Auto-generate keys field, and click on Create.



Screenshot displaying the create a new identity window in Azure IoT Explorer interface.

 Step 05: After creating the new identity, expand the Connection string with SAS token section. In the Symmetric key drop-down menu, select Primary Key, enter a sufficiently high figure in Expiration (minutes), click on the Generate Button, and copy the part of the SAS token connection string form SharedAccessSignature= onwards.

<pre>characterization provide comparison provide state of the second provide state of</pre>		
Acce de la forder d'acce de la forder de la	P Azure lo7 Explorer (preview) ile Edit, View Window Help	- 0
<pre>start > biolog > biolog > biolog > biolog = biolog =</pre>	Azure IoT Explorer (preview)	🐮 Notifications 🔘 Set
<pre> the state state of a st</pre>	Home > N3-IoT > Devices > N3	Suron_Gateway > Device identity
Invia utany Invia utany Invia utany Invia		62 Savr Q, Manage keys ∽
Prote stati Prote stati Prote statis	Device identity	
Stensey Contained Cont	Device twin	Device identity
Above Above </td <td>Telemetry</td> <td>Device ID 💿</td>	Telemetry	Device ID 💿
<pre>bit midd pict midd pict midd pict midd pict midd pict pict pict pict pict pict pict pict</pre>		NJuron_Gateway
Clock-d-dotter matage Clock-dotter matage Cl	S Direct method	Primary key 💿
Readewise free Interfere Interfere </td <td>Cloud-to-device message</td> <td>•</td>	Cloud-to-device message	•
In the good Bay components	Module identities	Secondary key 💿
Primary searchedule string Condense to lot Tube Condense to lot	IoT Plug and Play components	•
Secondary connection string Secondary connection string Connection string with \$45 balan Symmetric kay* Primary kay Station connection string InterConnection string InterConnection string Connection string Con		Primary connection string 💿
Secondary connection string		
Connection string with 545 taken Symmetric kay * Primary kay * Expanding invitable S25000 S456 taken connection string Interformation Connect this device to IoT hub The bit is a second string interformation in the second string in		Secondary connection string 💿
Connection string with 545 taken Symmetric key* Fringer year State taken connection string State taken connection string State taken connection string State taken connection string Connect this device to lot Thub Connect this de		
Symmetric kay * Primage kay Expiration printmetric) Expiration printmetric) Expiration printmetric) Expiration Expiratio		 Connection string with SAS taken ©
Primary kay Explanation primularly 525500 Side taken connection string Expected-why-one, Gateway-SharedAccessSynaktices Expected-why-one, Gateway-SharedAccessSynaktices Connect this device to 167 hub Image Image		Symmetric key *
Expiration (primers) 5350 C 545 taken connection string That Developed Access Spin was a field of a connection of the State and Access State Acce		Primary key 🗸
S2500 S45 bits connection string Is net Devoded - NDuron, Gateway-Share (Access Synatrue + Shared Access Synatrue + Shared		Expiration (minutes)
Sidd states connection string Exceptioned - Novem, Sale way: Shared Access Sign Ahree - Sale advocand syndrome in 105 bits assee doccess for 105 bits assee		\$25500
InterDenoide/Upuno.Gateway:ShareAccesSignature=DatesAccesSignature at /US/01/2000/000000000000000000000000000000		SAS token connection string
Connect this device to IoT hub Enable Enable		Is net Deviced - Navon, Steway, Shared Access Synature allow Access Synature allow Access Synature and Access Synature allow Access
Connect this device to toT hub		Generate
Enable Enable		Connect this device to IoT hub
		Enable

Screenshot displaying SAS Token Connection String in Azure IoT Explorer interface

Start Configuring the N3uron IIoT Platform

Log into the N3uron IIoT Platform Using a Web Browser

If this is your first time accessing N3uron, open your web browser and type http://localhost:8003/. By default, the **User** and **Password** are admin and n3uron respectively.

••• <>	http://n3uron.com/	Ċ Ê Ə +
🚍 Demo Project		N3uron
	4	
	Nauron	
	Uter: Utersame	
	Permovel: Protocold	
	Log in	
Reserved by Nurves (

Screenshot displaying the log-in interface within N3uron's IIoT platform WebUI.

ve

- Step 01: In the Navigation panel, select Config.
- Step 02: In the Explorer panel, select Modules.
- Step 03: Click on the Model menu and select New Module.
- Step 04: The instance can be given any name but for this example, we will use MQTT.
- Step 05: Set the Module Type property to MQTT Client. Leave the rest of the properties as their default values and click Save.



Screenshot displaying how to create an instance using N3uron's MQTT Module panel.

Configuring N3uron's MQTT Module within the WebUI's Explorer Panel

- Step 01: In the Explorer panel, select the MQTT instance you have just created.
- Step 02: Click on the Model menu bottom bar and select New Connection.
- Step 03: Give the new connection a name. In this example, it has been named AZURE.
- Step 04: Configure the connection properties:
 - A: Select Microsoft Azure from the Destination Broker drop-down menu.
 - B: In Username, enter the Hostname of your Azure IoT Hub followed by "/" and the name of your device. In our case, this will be N3-IoT.azure devices.net/N3uron_Gateway.
 - C: In Password, enter the string you copied from the SAS Token.
 - D: In Broker URL, enter the Hostname of your Azure IoT Hub. In our case, this is N3-IoT.azure-devices.net.
 - E: Leave the rest of the properties as their default values and click on Save.



Screenshot displaying Azure IoT Hub connection configuration in N3uron's MQTT module panel.

Now, navigate back to **Azure IoT Explorer** where, providing that everything has been properly configured, you should see your device connected to your IoT Hub.

			https://azuro	e.microsoft.com	C	
Edit View Window Help zure IoT Explorer (preview)						🕙 Notifications 🏾 🎒 Settin
ome > N3-loT > Devices						
🖬 New 🕐 Refresh 😨 Delete						
Query by device ID.,		,0 → (♥ Add query	parameter)			
Device ID	Status	Connection state	Authentication type	Last status update time	IoT Plug and Play device	Edge device
) Niluron, Gateway	Enabled	Connected	Sas	**		

Screenshot displaying Azure IoT Explorer connection with N3uron Node.

Publish Data Using N3uron's MQTT Module

- Step 01: Within the Model panel, right-click on the AZURE Connection you have just configured, select New Publisher, and give it a name. In this example, we will simply use Publisher.
- Step 02: Click on it and add a name in the Topic field. To publish an MQTT message to Azure, you cannot
 use any topic name, as it must be named according to the following format devices/{device_id}/messages/
 events/. In our example, we have used devices/N3uron Gateway/messages/events/.
- Step 03: GivClick on the Tag Filter button, select New Tag Filter, and change the default name. In this example, we have used Filter. Leave Mode, Path, and Regex pattern as their default values.

With this configuration, every tag configured in N3uron will be published to our Azure Broker.

•••				nttp://n3i	uron.com/	C	C) C) +
Demo Project							N3uro
nigation	e Explorer	11			Configuration		
E Data	- 🗰 This node Plant001	Tompletes	Property	Value		Output	
D. Real Time	Tegs		A D Publisher	(D Publisher)			
her Historical	D Views		Push interval Toole	devices/Whoron Gatesey/messa	pes/events/ devices/Murce Gateuro/messones/events/	×	
	- So Modules		Qu5	QIS 0	e		
A Marms	 MOTT 		Retain Rag	No	Volsel		
Sh Real Time	@ Logger		 Message options 		1000		
Mistorical	🚱 API		Send full message	As soon as possible	Town		
	P 😰 WebUI		Max number of messages	1	1		
O System	4 % Links		Interval between message	*	0		
Oilegnestics	Certificates		- Stone & Forward	No.			
C Config	E Lopper		Enable Duth	Yes	true true		
an Licensing	00000000000		Max. messages in disk	50000	50000		
			 Message format 				
A User		The second second	Serialization	JSON	 Json 		
Ax Logout		a == AZURS	Data structure Data format	tonpact 150	compart fam		
		🖌 🕰 Publisher	Compression	Note	- nene		
		S Filter	Compression level	None	a .		
			Encoding	UTFS	- vt/#		
			 Tap Filters 	· ·			
			Mode	Include	Include		
			Path	1	S /		
			Regex pattern				
			- Help				
		Tables - @ Desplot charges					

Screenshot displaying the publisher configuration setting within N3uron's MQTT module panel.

- Step 04: In the Explorer panel, select Tags.
- Step 05: In the Model menu, right-click on the folder icon, select New Tag, and give it a name. In this example, we will use Process_value.
- **Step 06:** Within the **Configuration** panel, set the following properties using the values shown below, leaving the rest of them as their default values:
 - Type: Number.
 - Simulation/Enabled: Yes

Demo Project							Nauron			
	a turbus				for the second second		rigaron			
isogaboo	e Experier	The second se			Configuration	0.1-1				
Data	- IN THE PARTY I	> D SimGroups	Subscribed_Value	(Tag)						
SA Real Time	Dian		Type	Number	nutber .					
Historical	A Statistics		Format	Default	 Overall 					
Alarma	A PD MOTT		Client access	Read Only	2 8					
S Real Line	P Looner		Persistency mode	0 - None						
A Managinal	Sa an		# Details							
No. However	D WALT		Description							
O System	4 Ge Linte		Englunits Default value	(null)	CRUELS					
SP Disgnostics	- To cris		# Simulation	12.622.5						
C Contra	Mg Lenncates		Erabled	No	Folse					
a Licensing	a 14990		Assigned views							
			 scang Reabled 	No	T fail se					
🛔 User			# RAW range							
Ar Lopour		E Model	Meximum	0						
		Process Value	Maximum	1000	2000					
		Subscribed Value	 Engineering Units range 							
			Maximum	1000	1000					
			 Clamp values 							
			Maserum	No	- false					
			Maximum	No	· facse					
			Enabled	Yes	- true					
			Module Type	MgttClient	MatoCLient					
			Module name	NOTT	 Agit 					
			4 Config	ATTRE Connections	ATH Charcelore					
			Tag address		And And the					
			# History							
			Enabled	No	✓ folse					
			Module name(s)							
			# Made							
			Mode	Change	change -					
						Deadband	0.04	0.04		
			A Range Y Minimum							
			Maximum	100	200					
			- Chart							
			Interpolation	Linear	s Grean					
			d Bate	Average	- 30p					
			Minimum	•						
			Maximum	0	8					
			 Alarms & Events 							
			Adms							
		Si Same di Desaid Hampes								

Screenshot displaying tag configuration setting within N3uron's MQTT module panel.

- Step 07: Go to the Azure IoT Explorer and in the Telemetry Tab of your device, you should see the messages being sent by your N3uron node in real-time, as shown in the image below.

Amore to T Evelener (erection)		- 6 X
lie gat Vew Window Help		
Azure IoT Explorer (preview)		Notifications 🥘 Settings
Home > N3-IoT > Devices > M	I3uron_Gateway > Telemetry	
=	Stop 🐼 Show system properties 🛞 Clear events () Simulate a device	
Device identity	Telemetry 📀	
Device two	Consumer group 🕥 Station	
S Direct method	Specify enqueue time	
Cloud-to-device message	(B)) 740 Una lealth in event hula	
R Module identities	Test Test Test	
	Sub Du U 2012 20210 CMT - 000 (Edital Energian Standard Energi "Badgin" {	

Screenshot displaying Azure IoT Explorer interface receiving messages from N3uron Node.

Subscribe to a Topic Using N3uron's MQTT Module

- **Step 01:** In the **Model** panel, right-click on the AZURE Connection, select New Subscriber and give it a name. In this example, we will simply use **Subscriber**.
- Step 02: Click on it and add a name in the Topic field. Since IoT Hub is not a general-purpose pub-sub messaging broker, it only supports the documented topic names and topic filters. IoT Hub delivers messages with the Topic Name devices/{device_id}/messages/devicebound/, or devices/{device_id}/messages/devicebound/, or devices/{device_id}/messages/ devicebound/{property_bag} if there are any message properties. In this example, we are going to enter the following string in the Topic: devices/N3uron_Gateway/messages/devicebound/#.
- Step 03: Set the following properties using the values shown below, leaving the rest of them as their default values:
 - Qos: Qos 0.
 - Encoding: UTF8.
 - Compression: None.
 - Serialization: JSON.
 - Data parser/Type: MqttClient JSON.

		<u>a</u>	паро			
Demo Project						N3uror
vigation	P Explorer		Press F	11 to exit full screen Configuration		_
B Data Sh Real Time	Tags	III Foughantes	Conservery Conservery Conservery Conservery Conservery Conservery Conservery Conservery Conservery	rsages/devicebound/# devices/NDuron_Gateway/hessages/deviceboun	0.000 M	
Historical	- S Modules		QoS QoS 0 # Keep-alive	•		
A Marms	• 😧 MQTT		Enable No Turneout 60000	False 60000		
Historical	@ A21		Message format Encoding UTFB	a stre		
O Sestem	P @ Webur		Compression Nove	some		
Oilegnostics	E Centrates		d Data parser			
Config Config	R Lopper		type Aqttclient Jone	Mattison		
- Constant						
Su Longer		E Model				
de cogous		a ⇒ AZURS				
		A Publisher A Subscriber				
		Internal International	- Help			

Screenshot displaying the subscriber configuration settings in N3uron's MQTT panel.

- Step 04: Within the Explorer panel, select Tags.
- Step 05: In the Model menu, right-click on the folder icon, select New Tag, and give it a name. In this example, we will use Subscribed_Value.
- Step 06: In the Configuration panel, set the following properties using the values shown below, leaving the rest of them as their default values:
 - Type: Number.
 - Source/Enabled: Yes.
 - Module Type: MqttClient.
 - Module name: MQTT.
 - Config/Subscriber: Azure/Subscriber.
- Step 07: Click Save.

N3uron www.n3uron.com How to Connect your Industrial Assets to Microsoft Azure IoT Hub using N3uron's MQTT Module Page 19

				nups.//az	are.microsoft.com	0	
Demo Project							N3uror
Invigation	* Explorer				Configuration		
E Data	4 🗰 This node Plant001	Templates	Property	Value		Output	
Sh Real Time	Sec. 20	P D SimGroups	Subscribed_Value	с в Тарн			
Lee Historical	D Views		Format	Default	 matter matter 		
	- S Modules		Deadband	0.00	0.04		
Alarms	 MOTT 		Client access	Read Only	× 8		
A Real Time	# Logger		Persistency mode	Q - None	• *		
Historical	😔 API		Description				
Description -	> 🚱 WebUT		Eng units				
O System	* % Links		Default value	<null></null>	COULD		
Ciagnostics	Certificates		d Simulation	No	E datas		
(& Config	R Lopger		Assigned verva	Ē	- Inter		
an Licensing			# Scaling	-			
			Enabled	No	Folse		
Coser 0			A RAW range				
Ar Logout		- B/	Maximum	1000	1000		
		 Process_Value 	# Engineering Units range				
		Subscribed_Value	Minimum				
			Maximum	1000	1000		
			 Clamp values 	-	•		
			Maximum	No	■ folse		
			# Source				
			Enabled	Yes	e true		
			Module Type	AgttClient	MatoCilent		
			4 Config	age 1	Mar 1		
			Subscriber	ATURE/Subscrüber	Attakt/Subscriber		
			Tag address				
			d History	No.	- And an		
			Module name(s)	10	Poule		
			# Config				
			# Made				
			Mode	Change	change		
			Deadbard # Range Y	0.00	P.79		
			Minimum	•			
			Maximum	100	100		
			4 Chart	1 damas			
			Interpolation Default method	Average	aid		
			# Rate				
			Minimum				
			Maximum	0	1		
			Alarms & Events				
			- Alarta				
		Print Print Print	1				
owned by Albron 1		Referent Relitorithation					I in as a date 2011-12-13 15:31-36 (MT-41-00

Screenshot displaying N3uron's MQTT panel showing tag configuration settings.

- Step 08: Go to the Azure IoT Explorer, click on the Cloud-to-device-message tab of your device.
- Step 09: In the Message Body enter the following in Message Payload:

 Step 10: Click on the Add system property drop-down menu and select messageid. In the Vaule field enter Test2, as shown below.

		inges/azare.interesenteenin		-
Azure IsT Explorer (preview) efditWindoweip				- 0
zure IoT Explorer (preview)			Notifications	 Setting
tome > N3-IoT > Devices > N3	luron_Gateway > Cloud-to-device messa	age		
	Send message to device			
Device identity	Cloud-to-device message 📀			
1 Telemetry	Message body			
Direct method	['/ <u>Subscribed_Value</u> ': [] '\71.35.14159;			1
Cloud-to-device message	"q"1 192. " <u>15</u> "1 1630668488618			
Module identities	Add timestamp to message body			
r tor mug and may components.	 Add custom property Key 	Add system property v		

Screenshot displaying cloud-to-device message within Azure IoT Explorer interface.

- Step 11: Click on the Send message to device button.
- **Step 12:** Navigate back to the N3uron WebUI interface and select **Data/Real Time** from the left-hand panel. You should now see the **Subscribed_Value** tag you created previously with a value of 3.14159.

			http://n3uron.com/									
📕 Demo Proje	ct											
lavigation	*	Tag groups									ġ.	Tag
E Data	1		Q	value			Sublev	els				
Real Time			_	Name 1	Value	Units	Quality	Link	Timestamp	Туре	Access	
Historical			-	Subscribed_value	3.14159		Good	 Local 	2021-09-03 13:28:08.618	number	R	
Alarms												
Real Time												
Historical												
System												
👽 Diagnostics												
Config												
Q. Licensing												
LUser												
ax Logout												

Screenshot displaying real-time values in N3uron's MQTT panel.

Conclusion on How to Exchange Data with Azure IoT Hub Using N3uron's MQTT Module

Connecting your assets to Microsoft Azure IoT Hub is extremely easy using N3uron's MQTT Client module. If you're ready to go using MQTT, <u>download the N3uron free trial version</u> and read our MQTT Client Manual on how to implement and use N3uron's MQTT software module on our communication platform. <u>Download the MQTT Client Manual</u>.