# **MX-AOPC UA Server User Manual**

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www.moxa.com/products



#### MX-AOPC UA Server User Manual

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# **Overview**

Moxa has pioneered the concept of "active type" OPC software in the automation industry. The patented MX-AOPC UA Server offers both polling (Modbus protocol) and non-polling (Moxa AOPC protocol) architectures alongside the standard OPC UA protocol, giving users the alternative of pull or push-based communication from Moxa's devices. OPC UA (Unified Architecture), which features more secure and reliable data communication between OPC servers and clients, is the next generation OPC standard (IEC 62541). By using Moxa's MX-AOPC UA Server, users can enjoy more secure and reliable data exchange and control.

The MX-AOPC UA Server includes:

- Server Runtime Service: Starts as a service by default after installation.
- Configuration Console: An offline configuration tool for configuring server settings.
- Viewer: An OPC client that allows developers, testers, and integrators to easily view tag values and test MX-AOPC UA Server and connections.

# System Requirements

#### **Hardware Requirements**

CPU: Intel Pentium 4 or above RAM: 512 MB (1024 MB or higher is recommended) Communication Interface: Ethernet or serial

#### **Software Requirements**

Operating System: Microsoft Windows 7/8/10/11, Microsoft Windows Server 2003/2008/2012/2016/2019/2022 Microsoft .NET Framework: v3.5 Service Pack 1 Editor (optional): Microsoft Office 2003 Excel or later

# **Specifications**

#### **OPC Server Specifications**

OPC Unified Architecture: 1.02 OPC Data Access: 1.0a, 2.0, 2.05a, 3.0 Device Protocols: Moxa AOPC, Modbus/TCP (master), Modbus/RTU (master)

#### **Products that Support AOPC Protocol**

**ioLogik:** ioLogik 2500 Series, ioLogik E1200 Series, ioLogik E1500 Series, ioLogik E2200 Series, ioLogik E4200, ioLogik W5300 Series, ioPAC 8500 Series, ioPAC 8600 Series Note: Please check Moxa's website for the most up-to-date list of supported products.

#### **Fully Supported OPC UA Server Profiles**

#### **Standard UA Server Profile**

Core Server Facet

User Token: User Name Password Server Facet
 SecurityPolicy: None
 Data Access Server Facet
 UA-TCP UA-SC UA Binary
 User Token: X509 Certificate Server Facet
 SecurityPolicy: Basic128Rsa15
 SecurityPolicy: Basic256Sha256
 SecurityPolicy: None

# **Installing MX-AOPC UA Server**

MX-AOPC UA Server can be downloaded from the Moxa website at <u>www.moxa.com</u>.

After downloading the file, unzip it and run setup.exe. The installation program will guide you through the MX-AOPC UA Server installation process.

# **Configuring Active Tags**

MX-AOPC UA Server will automatically receive active tags from Moxa's remote devices through the Moxa AOPC protocol once the tags are created. Refer to the device's user's manual to learn how to use the device's configuration utility to create active tags.

# **Opening the Configuration Console**

Open MX-AOPC UA Server's configuration console from the Windows Start menu: **Start > All Programs > MOXA > IO Server > MX-AOPC UA Suite > MX-AOPC UA Server**.

Select main network adapter the first time you open the configuration console.

Main Network Adapter:	Intel(R) Ethernet Connection (3) I218-LM
an nethoric naapter.	Intel(r) Eulemer connection (5) 1210-EN
Note: The main network	k adapter needs to be enabled for starting runtime service
	k adapter needs to be enabled for starting runtime service modified after this configuration.
	k adapter needs to be enabled for starting runtime service nodified after this configuration.

The configuration console is an offline configuration tool for configuring Server Runtime settings. When the configuration console is launched, it will automatically get the latest configurations from the Server Runtime. If any active tag is received, the device will be listed in the **Active Device List**. To manually get the latest configurations from the Server Runtime, click the **Get Configuration from Server** icon on the MX-AOPC UA Server menu bar. To manually update the settings to the Server Runtime, click the **Update Configuration to Server** icon on the menu bar.

Elle Edit View Tools Burnime Help         Achve Device List         Achve Device List         Modbus Device Group List	MX-AOPC UA Server	
Active Device List       Group No       Group Name         Active Device Group List       Group No       Group Name         Image: State St		
Image: Second Device Group List     Image: Second Device Group List	🔲 🕱 📅 🗊 🌒 额	😰 🛠 🗡 🖻 🔓 🗿 💐 🦉
		Group No Group Name
	Date Time Event	
	< []	111
Service Status: Running Time: 16:02:49 Device Count: 0 OPC Client Count: 0		

1

## ΝΟΤΕ

The first time you use MX-AOPC UA Server, we recommend turning off, or adding rules to, the Windows Firewall and then checking to see if MX-AOPC UA Server can receive active tags. If it can, turn the Windows Firewall back on and check it again. If MX-AOPC UA Server does not receive any active tags after you turn on the Windows Firewall, add aopcservice.exe in the Firewall Inbound Rules, and set it to Allow for Private, Public, and Domain network profiles.

## ΝΟΤΕ

Be sure to update the settings to the Server Runtime after changing the configuration. Otherwise, the Server Runtime will not reflect the configuration changes made using the configuration console.

# **Configuring Server Settings**

Before configuring devices and tags, configure the server settings described below under the **Tools** menu.

<u>File Edit View</u>	ools <u>R</u> untime <u>H</u> elp		
Active Device	Serial Port Settings AOPC Settings		X
Modbus Device	DCOM Configuration OPC UA Settings	•	
	Viewer System Log	•	
	Change Password		
	Options		

#### Change Password

We strongly recommend changing the password the first time you use the Configuration Console. The default password is "moxa", which is needed for verification when updating configurations to the Server Runtime or exporting the system log to a text file.

#### NOTE

When connecting an OPC UA client to MX-AOPC UA Server, use account name "admin" (the account name cannot be changed) and whatever the password is. The password is the same as the system password, which can be updated using **Tools > Change Password**.

#### • Serial Port Settings

Configure the PC's Serial Port Settings if a serial device is connected to MX-AOPC UA Server.

COM2         115200         None         8         1         None           COM3         115200         None         8         1         None           COM4         115200         None         8         1         None           COM5         115200         None         8         1         None           COM6         115200         None         8         1         None           COM6         115200         None         8         1         None           COM7         115200         None         8         1         None           COM8         115200         None         8         1         None           COM9         115200         None         8         1         None	COM1	115200					
COM3         115200         None         8         1         None           COM4         115200         None         8         1         None           COM5         115200         None         8         1         None           COM6         115200         None         8         1         None           COM6         115200         None         8         1         None           COM7         115200         None         8         1         None           COM8         115200         None         8         1         None           COM9         115200         None         8         1         None           COM9         115200         None         8         1         None           Sud Rate:         115200         None         8         1         None	COMO		None	8	1	None	
COM4       115200       None       8       1       None         COM5       115200       None       8       1       None         COM6       115200       None       8       1       None         COM7       115200       None       8       1       None         COM8       115200       None       8       1       None         COM9       115200       None       8       1       None         COM9       115200       None       8       1       None         South Common       115200       None       8       1       None	COMZ	115200	None	8	1	None	
COM5         115200         None         8         1         None           COM6         115200         None         8         1         None           COM7         115200         None         8         1         None           COM8         115200         None         8         1         None           COM9         115200         None         8         1         None           COM9         115200         None         8         1         None	COM3	115200	None	8	1	None	
COM6         115200         None         8         1         None           COM7         115200         None         8         1         None           COM8         115200         None         8         1         None           COM9         115200         None         8         1         None           COM9         115200         None         8         1         None	COM4	115200	None	8	1	None	
COM7         115200         None         8         1         None           COM8         115200         None         8         1         None           COM9         115200         None         8         1         None           COM9         115200         None         8         1         None           COM9         115200         None         8         1         None	COM5	115200	None	8	1	None	
COM8         115200         None         8         1         None           COM9         115200         None         8         1         None           Common Alexandre         115200         None         8         1         None           Common Alexandre         115200         None         8         1         None	COM6	115200	None	8	1	None	
COM9         115200         None         8         1         None           uud Rate:         115200         V         Flow Control:         None         V	COM7	115200	None	8	1	None	
ud Rate: 115200 V Flow Control: None V	COM8	115200	None	8	1	None	
sud Rate: 115200   Flow Control: None	COM9	115200	None	8	1	None	
	01440	115000	N1		4	M	
Add bits: 8 Stop Bits: 1 Parity: None V		200					]
				top bits:	• •	Parity:	•

#### AOPC Settings

Configure **AOPC Settings** if a Moxa device updates Active Tags to MX-AOPC UA Server.

AOPC Settings		
Default Network Interface:	Intel(R) 825	77LM Gigabit Network Connection
Active Tag Listen Port:	9900	Enabled
Command Timeout:	30	sec(s)
Heartbeat Tolerance:	30	sec(s)
		OK Cancel

# **Configuring Devices and Tags**

## Adding a Modbus Device

1. Click the **Modbus Device Group List** to select it and then click the **New Device Group** icon and type in the name of the device group.

MX-AOPC	UA Server						
<u>File</u> <u>E</u> dit	View <u>T</u> ools	<u>R</u> untime	Help				
		1	÷	13	<b>S</b>	X	Û
2	2 Device List 542-01 (00/90 2242-01 (00/90 us Device Gro	0:e8:21:b79 up List	91)	Group	No		Group
		oup Propert	DeviceG	roup 1	Ca	ncel	

2. Click the **New Device** icon and then configure the device properties.

le Edit View Iools Runtime H			1 1.57	
Active Device List 2542-01 (00:90:e8:5a:21:6e) E2242-01 (00:90:e8:21:6 7:91) Modbus Device Group List DeviceGroup1 Device Property	Device Name Enabled	9	ommunication Port	Protoco
Communicat	te Name: Device1 ion Port: Intel(R) Ethernet Connection (5 Protocol: Modbus/TCP protocol	☑ Enable Data Collec	tion	
Device Settings Device ID: ( IP Address: Port:	0.0.0.0	Timeout Settings Reconnect Delay: Reconnect Cydes: Cyde Delay:	3000 3 3	ms sec(s)
Delay between Polling:	1000 (ms, 100 to 3600000; 0 disabled)	Polling Timeout: Polling Retries:	3000	ms

3. Click the device group you just created to display a list of the devices in this group.

MX-AOPC UA Server			Pulling Roman		
<u>File Edit View Tools Runtime H</u> elp					
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Active Device List	Device Name	Enabled	Communication Port	Protocol	Device ID
2542-01 (00:90:e8:5a:21:6e)     E2242-01 (00:90:e8:21:b7:91)     Group List     DeviceGroup 1	Device1	Yes	Intel(R) Ethernet Connect	Modbus/TCP protocol	1
Device1					

# **Creating Modbus Tags**

1. Click the device name to select it and then click the **New Tag Group** icon and type in the name of the tag group.

MX-AOPC UA Server	-	-		
<u>File Edit View Tools R</u> u	untime <u>H</u> elp			
1 🖬 🖬 🗊		💿 🕵	XD	Ê
Active Device List     2542-01 (00:90:e8:5     E2242-01 (00:90:e8:5     Device Group List     DeviceGroup 1     DeviceGroup 1	21:b7:91)	Tag Group		The Firs
Tag Gro	up Property			
Tag G	roup Name: Tao	Group 1		
		ОК	Cancel	

2. Click the **New Tag** icon and then configure the tag properties.

MX-AOPC UA Server	10.00	11 Mag	al days
<u>File Edit View T</u> ools <u>R</u> untim	ie <u>H</u> elp		
1 🖬 🖬 🗊 🎝	] 🔊 🔊 🤅	📚 👗 🖻	Ê 🔒 🐌
Active Device List 2542-01 (00:90:e8:5a:21: E2242-01 (00:90:e8:21:b7 Modbus Device Group List Modbus DeviceGroup1 Device1 TagGroup1 Tag Prop	6e) 7:92)	Tag Name	The Last Tag Name
Fun	oction Code: 01: Read	d/Write Coils (0xxxx)	<b></b>
	Access: Read/Wri	te	
	Tag Name: Tag1		
	Description:		
Sta	rt Address: 0		
	Coil Length: 1	(1 to 2000)	
	Data Type: Boolean		•
Date Time Sta	art Number: 0	(0 to 99)	
2018/01/16 10:52			
2010/01/10 10:52	Conversion: None		
2018/01/16 10:52 Ta	g Quantity: 1		
2018/01/16 10:52			
2018/01/16 10:52 2018/01/16 10:52		OK	Cancel
2018/01/16 10:52:05	The lag 2542-01.7	AI-OI IS Created.	

3. The tag will be listed in the tag group.

MX-AOPC UA Server Eile <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>R</u> untime	Help				
	🔊 🥸 🕵 📈		<b>I</b>		
Active Device List	The First Tag Name	The Last Tag Name	Tag Type	Function Code	Access
Modbus Device Group List	🎭 Tag1		Polling	1	Read/Write
🖻 ··· 📗 Device 1					

# **Updating Configurations to the Server**

When you finish updating the configuration, click the **Update Configuration to Server** icon to update the configuration to the Server Runtime. When the **Verify Password** window pops up, enter the correct password and then click **OK** to activate the changes.

MX-AOPC UA Server				
<u>File Edit View Tools Runtime H</u> elp				
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Active Device List	Group No	Group Name		
2542-01 (00:90:e8:5a:21:6e) E2242-01 (00:90:e8:21:b7:91)	1	DeviceGroup1		
🖃 📲 Modbus Device Group List				
DeviceGroup1		Verify Password		
TagGroup1		Please enter password:		
		••••		
		OK Cancel		

# **Using the Viewer to Check Tag Values**

After completely updating the Server Runtime settings, click the **Viewer** icon to open the viewer to check that the tag value is correct.

MX-AOPC UA Server				• X
<u>File Edit View Tools Runtime Help</u>				
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	Group No 1	Group Name DeviceGroup1		

The device tree in the left panel should be the same as the tree displayed by the configuration console. Click a tag group name to display the group's tag values in the right panel.

2542-01 (00:90:e6: 5a:2)       Tag1       Boolean       05:20:34.118 2018/01/16       Good       405         Modbus Device Group List       Tag1       Boolean       05:20:34.118 2018/01/16       UTC +8       13:20:34.118 2018/01/16       Good       405         DeviceGroup1       DeviceI       TagGroup1       Tag1       Boolean       05:20:34.118 2018/01/16       Good       405         Modbus Device Group1       DeviceI       TagGroup1       Tag1       Boolean       05:20:34.118 2018/01/16       Good       405         Modbus Device Group1       DeviceI       TagGroup1       Tag1		lp					The second						
Image: Device Group List       Image: Device G			Tag Name	Data Type	Value	Device timestamp (UTC)	Time Zone	UTC+T.Z.	Quality	Update Cour			
Image: Sevie Croup List         Image: Sevie Croup List           Ima			🧐 Tag1	Boolean	1	05:20:34.118 2018/01/16	UTC+8	13:20:34.118 2018/01/16	Good	405			
Time         Event           ate         Tme         Event           13801/16         13:20:32         The tag 2542-01.AI-01 changes the value from 0.026 to 0.025           13801/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.027           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.027           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.027           13801/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.026 to 0.027           13801/16         13:20:04         The tag 2542-01.AI-03 changes the value from 0.026 to 0.027           13801/16         13:20:014         The tag 2542-01.AI-03 changes the value from 0													
Image: TagGroup1         Image: TagGroup1           Image: TagGroup1													
Image: Non-State         Event           ate         Time         Event           118/01/16         13:20:32         The tag 2542-01.Al-01 changes the value from 0.001 to 0.001           118/01/16         13:20:32         The tag 2542-01.Al-01 changes the value from 0.001 to 0.001           118/01/16         13:20:32         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:23         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:23         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:23         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.027 to 0.026           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.026 to 0.027           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.026 to 0.027           118/01/16         13:20:13         The tag 2542-01.Al-01 changes the value from 0.026 to 0.026           118/01/16         13:20:04         The tag 2542-01.Al-01													
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Time         Event           D18/01/16         13:20:32         The tag 2542-01.AI-01 changes the value from 0.001 to 0.001           D18/01/16         13:20:32         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           D18/01/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           D18/01/16         13:20:23         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           D18/01/16         13:20:13         The tag 2542-01.AI-03 changes the value from 0.027 to 0.026           D18/01/16         13:20:18         The tag 2542-01.AI-01 changes the value from 0.027 to 0.026           D18/01/16         13:20:13         The tag 2542-01.AI-01 changes the value from 0.026 to 0.027           D18/01/16         13:20:13         The tag 2542-01.AI-01 changes the value from 0.026 to 0.027           D18/01/16         13:20:13         The tag 2542-01.AI-01 changes the value from 0.026 to 0.027           D18/01/16         13:20:13         The tag 2542-01.AI-01 changes the value from 0.026 to 0.026           D18/01/16         13:20:03         The tag 2542-01.AI-01 changes the value from 0.026 to 0.026           D18/01/16         13:20:04         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           D18/01/16         13:20:04         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026													
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018/01/16         13:20:08         The tag 2542-01.AI-03 changes the value from 0.026 to 0.026           018/01/16         13:20:04         The tag DeviceGroup1.Device 1.TagGroup 1.Tag1 changes the value from 0 to 1	018/01/16 018/01/16 018/01/16 018/01/16 018/01/16	13:20:27 13:20:23 13:20:23 13:20:18	The tag 2542 The tag 2542 The tag 2542	-01.AI-03 changes -01.AI-01 changes -01.AI-03 changes	the value fro the value fro	m 0.000 to 0.001 m 0.027 to 0.026							
018/01/16 13:20:04 The tag DeviceGroup 1. Device 1. TagGroup 1. Tag 1 changes the value from 0 to 1	018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16	13:20:27 13:20:23 13:20:23 13:20:18 13:20:18	The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542	-01.AI-03 changes -01.AI-01 changes -01.AI-03 changes -01.AI-01 changes	the value fro the value fro the value fro	m 0.000 to 0.001 m 0.027 to 0.026 m 0.001 to 0.000							
	018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16	13:20:27 13:20:23 13:20:23 13:20:18 13:20:18 13:20:18	The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542	-01.AI-03 changes -01.AI-01 changes -01.AI-03 changes -01.AI-01 changes -01.AI-03 changes	the value fro the value fro the value fro the value fro	m 0.000 to 0.001 m 0.027 to 0.026 m 0.001 to 0.000 m 0.026 to 0.027							
010/01/10 10:00.00 The ter 05/40 01 45 00 terrer the units from 0.000 te 0.000	018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16 018/01/16	13:20:27 13:20:23 13:20:23 13:20:18 13:20:18 13:20:18 13:20:13 13:20:13	The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542 The tag 2542	-01.AI-03 changes -01.AI-01 changes -01.AI-03 changes -01.AI-01 changes -01.AI-03 changes -01.AI-03 changes	the value fro the value fro the value fro the value fro the value fro	m 0.000 to 0.001 m 0.027 to 0.026 m 0.001 to 0.000 m 0.026 to 0.027 m 0.001 to 0.001							

# **Configuring OPC UA Settings**

You should configure OPC UA settings before connecting an OPC UA client to MX-AOPC UA Server. To access OPC UA Settings options, click **Tools** ( **OPC UA Settings**. Instructions for each option are:.

MX-AOPC UA Serve	er			
<u>File Edit View To</u>	ools <u>R</u> untime <u>H</u> elp			
	Serial Port Settings	X 🖻 🖻 🔐 🧦 💐		
Active Device	AOPC Settings DCOM Configuration	Group Name		
🖻 ··· (🏙 Modbus Devic	OPC UA Settings	Server Endpoints Settings		
DeviceGri	Viewer System Log →	Security Policy Certificates Management		
	Change Password			
	Options			
· · · · · · · · · · · · · · · · · · ·				

#### • Server Endpoints Settings

"Server Endpoints Settings" are a list of interfaces that UA clients can use to communicate with MX-AOPC UA Server. MX-AOPC UA Server supports Universal Resource Locator (URL) binary type protocols.

To add a new interface to the list, select the appropriate network interface in the **Network Interface** drop-down box and type the port number for the URL in the **Port Number** input box. Click **Add** to add this new server endpoint to the list.

erver Endpoints Se	stungs	
URL		Status
opc.tcp://192.168.	12.112:53192/MXAOPC/UAServer	Valid
Network Interface:	Intel(R) 82577LM Gigabit Network C	onnection 🔹
Port Number:	53192	
	opc.tcp://192.168.12.112:53192/M)	(AOPC/UAServer
Add	Delete Apply	Close Help

#### Security Policy

The security policy is applied to connections between OPC UA clients and MX-AOPC UA Server. Security options that can be selected are **None**, **Basic128Rsa15: Sign**, **Basic128Rsa15: Sign and Encrypt**, **Basic256Sha256: Sign**, or **Basic256Sha256: Sign and Encrypt**. Besides "None", you will need to configure **Certificates Management** settings (see below).

Security Policy Setting	$\times$
None	
Basic128Rsa15 - Sign	
Basic128Rsa15 - Sign and Encrypt	
Basic256Sha256 - Sign	
Basic256Sha256 - Sign and Encrypt	
OK Cancel	

#### NOTE

The default account and password for connecting an OPC UA client to the server are:

Account: admin Password: moxa

assword: moxa

The account name cannot be changed. To change the password, click **Tools > Change Password**.

#### Certificates Management

When the security option is chosen, besides "None", importing an OPC UA client's CA (Certificate Authority) file into MX-AOPC UA Server, and exporting the MX-AOPC UA Server's CA file to OPC UA Clients are both required.

Click the **Trust Clients** tab, click **Import**, and select the client's CA file to import it into MX-AOPC UA Server.

	IIDI		
ent Name UA Local Discovery Server	URI um:charleszk-chen.moxa.com:UALocalDiscove		
	4		
nport Export Remove	Reject View Certificate		

Click the **Instance Certificates** tab and click **Export Server Certificate** to export MX-AOPC UA Server's CA file to OPC UA Clients.

Certificates Management	X
Trust Clients Instance Certificates	
View Server Certificate Export Server Certificate	Certificate MX-AOPC UA Server is from 2014/10/28 09:42:23 AM to 2019/10/2 09:42:23 AM
Reissue Certificate	
	Close Help

Click the **Update Configuration to Server** icon to enable any changes that have been made to the OPC UA configuration.

#### NOTE

After reissuing certificates or re-installing MX-AOPC UA Server, you will need to export the Server Certificate once again to OPC UA clients.

# **Main Screen Overview**

MX-AOPC UA Server's configuration console displays the mapped I/O device with the settings of every I/O tag. It also shows the Server Runtime status and number of OPC clients.

	iew <u>T</u> ools <u>R</u> ur	ntime <u>H</u> elp	> 2			
<b>1</b>			🔊 📽 🗡 🖻	) 🛱 🔒 🚚	A A A A A A A A A A A A A A A A A A A	
Active D			Tag Name	Data Type	Access Rights	Description
	42-01 (00:90:e8:16:	e7:15)	Sec. 100 E2242-01.DI-00	Boolean	Read-only	DI
		Sec. 101-01	Boolean	Read-only	DI	
Devi			Sec. 102	Boolean	Read-only	DI
	TagGroup1		😵 E2242-01.DI-03	Boolean	Read-only	DI
	agoroup1		See E2242-01.DI-04	Boolean	Read-only	DI
			Sec. 101-05	Boolean	Read-only	Door Status
			👒 E2242-01.DI-06	Boolean	Read-only	DI
			See E2242-01.DI-07	Boolean	Read-only	DI
	4		% E2242-01.DI-08	Boolean 5	Read-only	DI
			See E2242-01.DI-09	Boolean	Read-only	DI
			🥸 E2242-01.DI-10	Boolean	Read-only	DI
			👒 E2242-01.DI-11	Boolean	Read-only	DI
			🧐 E2242-01.SysConnect-00	0 Boolean	Read-only	System Connection
Date	Time	Event				
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-11' is	s changed to 0		
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-10' is	s changed to 0		
2014/12/29	13:22:01		ue of the tag 'E2242-01.DI-09' is			
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-08' is	s changed to 0		
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-07' is	s changed to 0		
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-06' is	s changed to 0 6		
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-05' is	s changed to 0		
	13:22:01	The valu	ue of the tag 'E2242-01.DI-04' is	s changed to 0		
2014/12/29	13:22:01	The valu	ue of the tag 'E2242-01.DI-03' is	s changed to 0		
	13:22:01			s changed to 0		
2014/12/29	13:22:01	The value	ue of the tag 'E2242-01.DI-02' is	o changed to o		
2014/12/29 2014/12/29			ue of the tag E2242-01.DI-02 is lue of the tag 'E2242-01.DI-01' is			
2014/12/29 2014/12/29 2014/12/29	13:22:01	The valu	-	s changed to 0		
2014/12/29 2014/12/29 2014/12/29 2014/12/29	13:22:01 13:22:01	The valu The valu	ue of the tag 'E2242-01.DI-01' is	s changed to 0 s changed to 0	anged to 0	
2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29	13:22:01 13:22:01 13:22:01	The valu The valu The valu	ue of the tag 'E2242-01.DI-01' is ue of the tag 'E2242-01.DI-00' is	s changed to 0 s changed to 0 vice1.TagGroup1.Tag1' is cha	anged to 0	

No.	Zone	Description
1	Software Title	Displays the name of the software: MX-AOPC UA Server
2	Menu	All configuration functions
3	Quick Launch Bar	Frequently used icons
4	Device View	All devices and tags
5	Detailed View	Detailed settings of the devices and tags
6	Log View	Server Runtime logs
7	Server Runtime Status	Shows if the Server Runtime Service is <b>Running</b> or <b>Stopped</b>
8	Server Time	Displays the server time (same as the PC's time)
9	Numbers of Device	Displays the number of devices listed in Device View
10	Numbers of OPC Client	Displays the number of OPC clients connected to MX-AOPC UA Server

# **Menu Items**

All operations can be accessed from the following menu items.

## File

Use the **File** menu to manage project files, device tags, and server configuration.

<u>F</u> ile	<u>E</u> dit <u>V</u> iew <u>T</u> ools <u>R</u> untime	<u>H</u> elp	_
	New	Ctrl+N	6
	Open	Ctrl+0	1
	Save	Ctrl+S	lo
	Save As		ł
	Import	×	
	Export	•	t
	Get Configuration from Server		ŀ
	Update Configuration to Server		l
	1 AOPC_Srv1.aop		
	Exit		

- New: Create a new project file.
- **Open:** Open an existing project file.
- **Save:** Save the current project.
- **Save As:** Save the current project file as another project with a different filename.
- Import:
  - > Ethernet Modbus Device (.csv): Import Ethernet Modbus devices into device groups from a csv file.

Item	Format	Length	Note
DeviceGroupName	0 to 9, A to Z, a to z, Symbols	30	"." is not allowed.
DeviceName	0 to 9, A to Z, a to z, Symbols	30	"." is not allowed.
Enable	0: disable; 1: enable	-	
CommunicationPort	Network adapter name	-	
DeviceID	1 to 247	-	
IPAddress	xxx.xxx.xxx.xxx	-	
Port	0 to 65535	-	
ReconnectDelay(ms)	0 to 30000	-	
ReconnectCycle	0 to 10	-	
CycleDelay(sec)	0 to 86400	-	
PollingTimeout(ms)	0 to 30000	-	
PollingRetries	0 to 10	-	
DelayBetweenPolls(ms)	100 to 3600000; 0 disabled	-	

> Serial Modbus Device (.csv): Import Serial Modbus devices into device groups from a csv file.

Item	Format	Length	Note
DeviceGroupName	0 to 9, A to Z, a to z, Symbols	30	"." is not allowed.
DeviceName	0 to 9, A to Z, a to z, Symbols	30	"." is not allowed.
Enable	0: disable; 1: enable	-	
CommunicationPort	Serial port name	-	
DeviceID	1 to 247	-	
ResponseTimeout(ms)	0 to 30000	-	

> Device Tags (.csv): Import device tags into a Modbus device from a csv file.

Device rugs (.esv)	: Import device tags into a Modbus devic		ine.
Item	Format	Length	Note
GroupName	0 to 9, A to Z, a to z, Symbols	30	"." is not allowed.
TagName	0 to 9, A to Z, Symbols	30	"." is not allowed.
FunctionCode	1 to 4	-	1: Read/Write Coils 2: Read Discrete Inputs 3: Read/Write Holding Registers 4: Read Input Registers
Address	0 to 65535	-	
DataType	Boolean Unsigned short integer Unsigned integer Float	-	<ul> <li>Use Boolean with FunctionCode 1 or 2.</li> <li>Use other DataTypes with FunctionCode 3 or 4.</li> </ul>
Description	0 to 9, A to Z, a to z, Symbols	25	
TagQuantity	1 to 2000 when function code is 1 or 2. 1 to 125 when function code is 3 or 4.	TagQuantity	
DataConversion	None "LoByte & HiByte" (if Unsigned Short Integer is defined) "HiByte & LoByte" (if Unsigned Short Integer is defined) "LoWord & HiWord" (if Unsigned Integer or Float is defined) "HiWord & LoWord" (if Unsigned Integer or Float is defined)	-	
StartNumber	0 to 99	-	

#### • Export:

- > Ethernet Modbus Device (.csv): Export Ethernet Modbus devices from device groups to a csv file.
- > Serial Modbus Device (.csv): Export Serial Modbus devices from device groups to a csv file.
- > Device Tags (.csv): Export device tags from a Modbus device to a csv file.
- **Get Configuration from Server:** Get the latest configuration from the Server Runtime.
- **Update Configuration to Server:** Update the configuration to the Server Runtime from the Configuration Console.
- Previous saved files: Quickly open previously saved project files.
- Exit: Close the Configuration Console.

## NOTE

Active Tags cannot be imported into an Active Device folder in the Configuration Console from a csv file, or vice versa. Active Tags are automatically created by a Moxa active tag device. Refer to the **Specifications** section for the **Products that Support AOPC Protocol**, and refer to the device's user's manual to see how to create active tags using the device's configuration utility.

## NOTE

Execute the **Export** function to get a csv template.

## Edit

MX-AOPC UA Server File Edit View Tools Runtime Help Ctrl+X Cut Ctrl+C Copy E---Ctrl+V Paste ag Name Delete Del Tag1 Ė.... Select All Ctrl+A New Device Group New Device New Tag Group New Tag Properties...

Use the **Edit** menu to edit settings of devices and tags.

- Cut: Cut a tag group or selected tags.
- **Copy:** Copy a tag group or selected tags.
- Paste: Paste a cut or copied tag group into a device or paste cut or copied tags into a tag group.
- **Delete:** Delete the selected device, a selected tag group, or selected tags.
- Select All: Select all tags in a tag group.
- New Device Group: Create a new device group.
- New Device: Create a new Modbus device.
- New Tag Group: Create a new tag group.
- New Tag: Create a new tag.
- Properties: Change the settings of an existing device group, device, tag group, or tag.

#### NOTE

The properties of an active device or active tag cannot be changed from the configuration console. Refer to the device's user's manual to see how to use the device's configuration utility to change active device or active tag settings.

### View

Use the **View** menu to change the display settings of the Device View panel.



- Expand All Devices: Expand all devices in the Device View panel.
- Collapse All Devices: Collapse all devices in the Device View panel.

## Tools

Use the **Tools** menu to configure serial ports, OPC settings, system log, password, console environment settings, or to launch Viewer.

File Edit View T	ools <u>R</u> untime <u>H</u> elp	_	_
	Serial Port Settings		X
Active Device	AOPC Settings DCOM Configuration OPC UA Settings	•	
	Viewer System Log	•	
	Change Password Options		

#### • Serial Port Settings

Serial Port Settings

None None N Parity: None	1 1 ·	8 8 9 Control: None Stop Bits: 1	None None Flo	115200 115200 115200 115200 8	COM9 aud Rate:
 None	1	8	None	115200	COM9
None	1	8	None	115200	COM9
None	1	8	None	115200	
				115000	COM8
None	1	8	None	115200	COM7
None	1	8	None	115200	COM6
None	1	8	None	115200	COM5
None	1	8	None	115200	COM4
None	1	8	None	115200	COM3
None	1	8	None	115200	COM1
None None	1	8	None None	115200 115200	Port COM1 COM2 COM3 COM4

- > **Baud Rate:** 300 to 921600 bps; default: 115200 bps
- > Flow Control: None, RTS/CTS, or XON/XOFF; default: None
- > **Data Bits:** 5, 6, 7, or 8; default: 8
- Stop Bits: 1 or 2; default: 1
- > **Parity:** Even, Odd, or None; default: None

#### AOPC Settings

AOPC Settings		
Default Network Interface:	Intel(R) 825	77LM Gigabit Network Connection
Active Tag Listen Port:	9900	Enabled
Command Timeout:	30	sec(s)
Heartbeat Tolerance:	30	sec(s)
		OK Cancel

- Default Network Interface: Select a network interface that remote devices can use to connect to MX-AOPC UA Server.
- Active Tag Listen Port: The preferred TCP socket port for receiving active tags from remote devices (default: 9900).
- Command Timeout: The socket timeout interval (Port: 9500 and 9900) for controlling output channels on remote devices: 0 to 60; default: 30 sec.
- Heartbeat Tolerance: An additional timeout interval to wait for a heartbeat signal from remote devices: 0 to 60; default: 30 sec.
- DCOM Configuration: Configure DCOM settings for your security policy. Refer to Appendix A for details.

#### • OPC UA Settings

MX-AOPC UA Serv	er	ADDRESS BOLLANT THE COL
<u>File Edit View T</u>	ools <u>R</u> untime <u>H</u> elp	
	Serial Port Settings	X 🖻 🖻 🕯 🦉 🧦
	AOPC Settings	
Active Device     Modbus Device	DCOM Configuration	Group Name
🗄 🗐 DeviceGri	OPC UA Settings	Server Endpoints Settings
	Viewer System Log	Security Policy Certificates Management
	Change Password	
	Options	
		-

#### > Server Endpoints Settings:

"Server Endpoints Settings" are a list of interfaces that UA clients can use to communicate with MX-AOPC UA Server. MX-AOPC UA Server supports Universal Resource Locator (URL) binary type protocols.

To add a new interface to the list, select the appropriate network interface in the **Network Interface** drop-down box and type the port number for the URL in the **Port Number** (default: 53192) input box. Click **Add** to add this new server endpoint to the list.

Server Endpoints Settings	×
URL	Status
opc.tcp://192.168.12.112:53192/MXAOPC/UAServer	Valid
Network Interface: Intel(R) 82577LM Gigabit Network Con	nection 🔻
Port Number: 53192	
H102 102 10 112 52102 MVA	0001100-000
opc.tcp://192.168.12.112:53192/MXA	JPC/UAServer
Add Delete Apply	Close Help

#### > Security Policy

The security policy applies to connections between OPC UA clients and MX-AOPC UA Server. Security options that can be selected are None, Basic128Rsa15: Sign, Basic128Rsa15: Sign and Encrypt, Basic256Sha256: Sign, or Basic256Sha256: Sign and Encrypt. Besides "None", you will need to configure Certificates Management settings (see below).

Security Policy Setting	$\times$
✓ None	
Basic 128Rsa 15 - Sign	
Basic128Rsa15 - Sign and Encrypt	
Basic256Sha256 - Sign	
Basic256Sha256 - Sign and Encrypt	
OK Cancel	

NOTE

The default Account and Password for connecting an OPC UA client to the server are:

Account: admin Password: moxa

The account name cannot be changed. To change the password, click **Tools > Change Password**.

#### > Certificates Management

When the security option is chosen besides "None", importing an OPC UA client's CA (Certificate Authority) file into MX-AOPC UA Server and exporting the MX-AOPC UA Server's CA file to OPC UA Clients are both required.

Click the **Trust Clients** tab, click **Import**, and select the client's CA file to import it into MX-AOPC UA Server.

Server	urn:charleszk-chen.n	noxa.com:UALocalDiscove
III		
	III	III

Click the **Instance Certificates** tab and click **Export Server Certificate** to export MX-AOPC UA Server's CA file to OPC UA Clients.

Certific	ates Management		x
Tru	st Clients Instance Certificates		
	View Server Certificate Export Server Certificate	Certificate MX-AOPC UA Server is from 2014/10/28 09:42:23 AM to 2019/10/2 09:42:23 AM	
	Reissue Certificate		
		Close He	lp

Click the **Update Configuration to Server** icon to enable any changes that have been made to the OPC UA configuration.

#### . .

NOTE

After reissuing certificates or re-installing MX-AOPC UA Server, you will need to export the Server Certificate once again to OPC UA clients.

• **Viewer:** Open the viewer to check that the tag value is correct.

#### System Log

ile <u>E</u> dit <u>V</u> iew <u>T</u>	ools <u>R</u> untime <u>H</u> elp			
	Serial Port Settings		XD	Ê
	AOPC Settings DCOM Configuration OPC UA Settings	,		Group Name DeviceGroup1
	Viewer			
	System Log	•	Save to Te	ext File
	Change Password		Reset Syst System Lo	em Log g Settings
	Options	- h		

> **Save to Text File:** Save MX-AOPC UA Server's system log to a text file. You will be required to enter a password (default password: moxa).

Verify Password	
Please enter password:	
••••	
OK Cancel	
Caricer	

Reset System Log: Reset MX-AOPC UA Server's system log. You will be required to enter a password (default password: moxa).

ActiveOPC	
Do you want to reset system log?	Verify Password Please enter password:
Yes No	OK Cancel

System Log Settings: Defines the maximum number of records that can be saved in the MX-AOPC UA Server's system log: 1 to 30000; default: 30000.

System Log Setti	ings	
Event Records:	30000	(1~30000)
		OK Cancel

• **Change Password:** Change the MX-AOPC UA Server's system password. The password is required when updating configurations to System Runtime, saving system logs to a text file, or resetting system log.

Length: 4 to 128; acceptable characters: A to Z, a to z, 0 to 9, Symbols; default: moxa.

Change Password		x
Old Password:		
New Password:		
Confirm Password:		
	OK Ca	ancel

• **Options:** Configure environment settings for the server's configuration console.

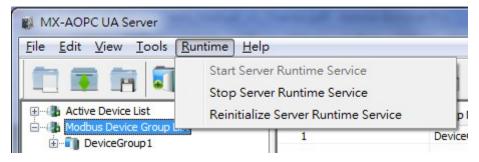
Options
Startup
Configuration File          Image: Configuration File         Image: Configuration Provide the State of Stat
OK Cancel

## NOTE

If **Automatically save configuration every xx min(s)** is enabled, the configuration file will be automatically saved only when a file name is defined. Be sure to save your configuration file after creating a new project file.

## Runtime

Use the Runtime menu to Start, Stop, or Reinitialize Server Runtime Service.

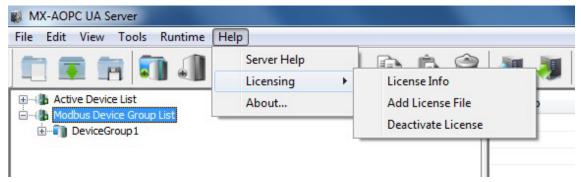


## Help

Use the **Help** menu to launch the server's help documentation, to check the server's license status, to add a license file, or check server version.

MX-AOPC UA Server	
<u>File Edit View Tools Runtime</u>	Help
	Server Help Licensing
Active Device List	About
Hodbus Device Group List	1

- Server Help: Launch MX-AOPC UA Server's help documentation.
- Licensing



License Info: Displays the server's User Code, License Status, and the Time Remaining on the license. Refer to Chapter 6: License Registration and Activation to learn how to activate the license.

User Code		×
User Code:	1613EB128766	
License Status:	Trial Version	
Time Remaining:	11 days	
		OK

- Add License File: Import a license file after completing the license registration process. Refer to Chapter 6: License Registration and Activation to learn how to activate the license.
- Deactivate License: Deactivate the current paid license version and load factory default settings. Note that when you deactivate the license, your license file and runtime configurations will be deleted. Please backup your runtime configurations before executing a license deactivation procedure.
- About: Displays MX-AOPC UA Server's version number and build number.

Moxa MX-AOPC UA Server	1.0 build 14122910	ОК
Copyright (C) 2014 Moxa Inc.		

# **Device Group**

In this section, we explain how to use the configuration console to add, edit, and delete device groups.

MX-AOPC UA Server's design logic is user-application oriented. As seen below, device groups can be created based on application, such as **SiteA** or **SiteB**.

File Edit Vi	JA Server iew <u>T</u> ools <u>R</u> ur	ntime Help								x
		·	s 🕵	X	Đ	<u> </u>	-	1	<b>N</b>	
Modbus	42-01 (00:90:e8:16: Device Group List A ioLogik E2242 Tump	:e7:15)	Group No 1 2			Group Name SiteA SiteB				
			l							
Date	Time	Event								
	Time 13:22:01		of the tag 'F	2242-01.0	)I-11' is d	anged to 0				
014/12/29		The value	of the tag 'E2			-				
014/12/29 014/12/29	13:22:01	The value The value	of the tag 'E	2242-01.0	I-10' is ch	anged to 0				
2014/12/29 2014/12/29 2014/12/29	13:22:01 13:22:01	The value The value The value	of the tag 'Ea	2242-01.D 2242-01.D	0I-10' is ch 0I-09' is ch	anged to 0 anged to 0				
2014/12/29 2014/12/29 2014/12/29 2014/12/29	13:22:01 13:22:01 13:22:01	The value The value The value The value	of the tag 'E	2242-01.D 2242-01.D 2242-01.D	0I-10' is ch 0I-09' is ch 0I-08' is ch	anged to 0 anged to 0 anged to 0				
2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29 2014/12/29	13:22:01 13:22:01 13:22:01 13:22:01	The value The value The value The value The value	of the tag 'E2 of the tag 'E2 of the tag 'E2	2242-01.D 2242-01.D 2242-01.D 2242-01.D	0I-10' is ch 0I-09' is ch 0I-08' is ch 0I-07' is ch	anged to 0 anged to 0 anged to 0 anged to 0				
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# Adding a Device Group

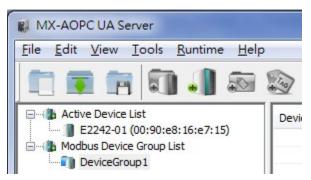
1. Right click **Modbus Device Group List** and then click **New Device Group** in the pop-up menu, or click **Modbus Device Group List** to select it, and then click the **New Device Group** icon on the Quick Launch toolbar.



Type in the name of the device group (max. length = 30 characters; "." is not allowed), and then click OK.



3. The new device group will be added to the **Modbus Device Group List**.



## **Editing a Device Group**

Right click the device group you would like to edit and then click **Properties** in the pop-up menu, or click the device group to select it and then click the **Properties** icon on the Quick Launch toolbar to open the properties window.



## **Deleting a Device Group**

Right click the device group you would like to delete and then click **Delete** in the pop-up menu, or click the device group to select it and then click the **Delete** icon from the Quick Launch toolbar.

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Active Device List     E2242-01 (00:9     Modbus Device Group1		Device Name		E	Enabled		
	New Device						
	Delete						
	Properties						

## **Active Devices**

In this section we explain how to use the configuration console to delete active devices.

MX-AOPC UA Server will automatically receive the registration from a Moxa active device at a remote site. Refer to the Moxa I/O device's user's manual to learn how to use the device's configuration utility to create active tags.

## **Deleting an Active Device from the Active Device Group List**

Right click the active device you would like to delete and then click **Delete** in the pop-up menu, or click the active device to select it and then click the **Delete** icon from the Quick Launch toolbar.

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Active Device List		Tag Name	Data Type
E2242-01 (00:90:e8:16:		242-01.DI-00	Boolean
DeviceGroup1	Delete	242-01.DI-01	Boolean
		😵 E2242-01.DI-02	Boolean
		\$ F2242-01 DI-03	Boolean

#### NOTE

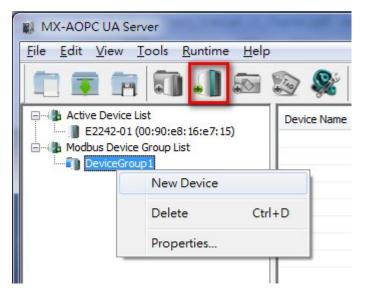
After an active-device name is changed through the web console or configuration utility, delete the active device on the MX-AOPC UA Server and execute "Update Configuration to Server." The change will take effect the next time the device creates active tags to the MX-AOPC UA Server.

# **Modbus Devices**

In this section, we explain how to use the configuration console to add, edit, delete, and move Modbus devices.

## Adding a Modbus Device to a Device Group

Right click the device group you would like to add a new Modbus device to and then click **New Device** in the pop-up menu. You may instead click the device group to select it and then click the **New Device** icon on the Quick Launch toolbar.



### **Ethernet Communication Port**

If an Ethernet communication port is selected, the **Device Property** configuration window will appear as shown below:

Enable Data Collec	tion	
]		
-		
Timeout Settings		
Reconnect Delay:	3000	ms
Reconnect Cycles:	3	
Cycle Delay:	3	sec(s)
Polling Timeout:	3000	ms
Polling Retries:	3	
	Timeout Settings Reconnect Delay: Reconnect Cydes: Cyde Delay: Polling Timeout:	Timeout Settings Reconnect Delay: 3000 Reconnect Cycles: 3 Cycle Delay: 3 Polling Timeout: 3000

- Device Name: Name of the Modbus device (max. length = 30; "." is not allowed).
- Enable Data Collection: Enable or disable data collection for this Modbus device.
- Communication Port: Select the communication interface of this Modbus device.

- **Device ID:** The device ID of this Modbus device (options: 1 to 247).
- IP Address: The IP Address of this Modbus device.
- **Port:** The TCP port of this Modbus device (options: 0 to 65535).
- **Delay between Polling:** The delay time after the server polls Modbus register(s) of this device (options: ms, 100 to 3600000; 0 disabled).
- **Reconnect Delay:** The delay time after the server tries to reconnect this Modbus device (options: 0 to 30000; default: 3000).
- Reconnect Cycles: The maximum number of reconnect cycles (options: 0 to 10; default: 3).
- **Cycle Delay:** The delay time after reaching the maximum number of reconnect cycles (options: 0 to 86400; default: 3).
- **Polling Timeout:** The timeout value when the server polls data from this Modbus device (options: 0 to 30000; default: 3000).
- **Polling Retries:** The maximum number of retries after a polling timeout occurs (options: 0 to 10; default: 3).

Polling Retry	Reconnect Cycle	1
$\begin{array}{rcl} {\sf Polling} & \rightarrow & {\sf When \ no \ response, \ waiting} \\ {\sf until \ {\sf Polling \ Timeout}} & \rightarrow & {\sf Polling \ Retries} & - \end{array}$	Reconnect $ ightarrow$ When failure, waiting until -	Reached Reconnect Cycles
<u> </u>	<u> </u>	Waiting until Cycle Delay
Retry	Retry	
	Retry	

### **Serial Communication Port**

If a serial communication port is selected, the **Device Property** configuration window will appear as shown below:

Device Name:	Device1	Enable Data Collect	tion	
Communication Port:	COM1	•		
	Modbus/RTU protocol			
evice Settings		Timeout Settings		
Unit ID: 1	•	Response Timeout:	3000	ms
		Polling Delay:	10	ms

The following configuration items only appear when a serial communication port is selected.

- **Response Timeout:** The timeout value when the server polls the data of this Modbus device (options: 0 to 30000; default: 3000).
- Polling Delay: The delay time after a polling timeout occurs (0 to 60000; default: 10).

The newly created device group will now be shown as belonging to this group.

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Active Device List	Device Name	Enabled	Communication Port	Protocol	Ĺ
E2242-01 (00:90:e8:16:e7:15)	Device1	Yes	Intel(R) 82577LM Gigabit	Modbus/TCP protocol	1
Device Group List	Device2	Yes	COM1	Modbus/RTU protocol	1
Device1	1000 C 11				
Device2					

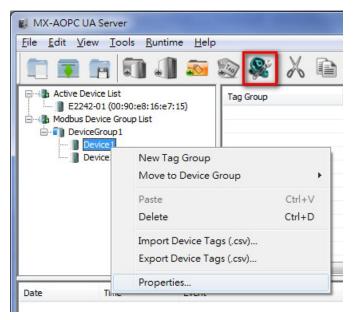
## **Importing a List of Modbus Devices into Device Groups**

Right click the Modbus Device Group List and then click **Ethernet Modbus Device (.csv)** or **Serial Modbus Device (.csv)** in the pop-up menu to import a list of Modbus devices into device groups. Select a csv file on your PC to import the devices listed in the csv file into the Device Groups. Refer to **Chapter 3: Configuration Console ( Menu Items ( File** for detailed csv file formats.

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→		Group No		Group Nam	ne	
		1		DeviceGrou		
L DeviceGroup1	New Devi	ce Group				
	Import	•	Ether	net Modbu	s Device (.csv)	
	Export				evice (.csv)	

## **Editing a Modbus Device**

Right click the Modbus device you would like to edit and then click **Properties...** in the pop-up menu, or click the Modbus device to select it and then click the **Properties** icon in the Quick Launch toolbar to open the properties configuration window.

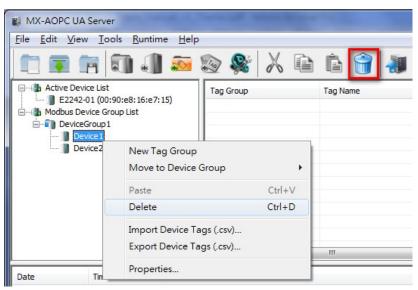


#### NOTE

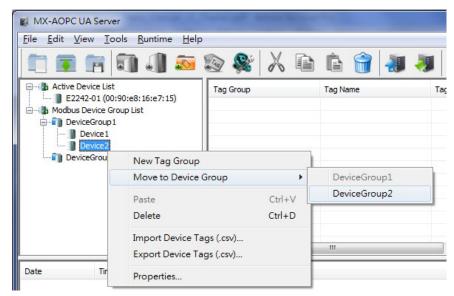
You are not allowed to cut, copy, or paste a Modbus device.

## **Deleting a Modbus Device**

Right click the Modbus device and then click **Delete** in the pop-up menu, or click the Modbus device to select it and then click the **Delete** icon in the Quick Launch toolbar.

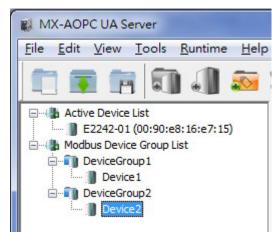


## Moving a Modbus Device to a Different Device Group



1. Right click the Modbus device and then click the target device group in the pop-up menu.

2. The Modbus device will be moved to the target device group.



# **Tag Groups**

In this section, we explain how to use the configuration console to add, edit, cut, copy, paste, and delete tag groups.

## Adding a Tag Group to a Device

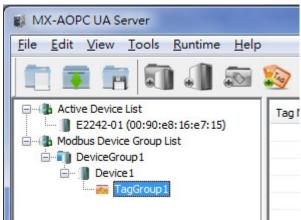
 Right click the device that the tag group will be added to and then click New Tag Group in the pop-up menu, or click the device to select it and then click the New Tag Group icon on the Quick Launch toolbar.



2. Type in the name of the tag group (max. length = 30 characters; "." is not allowed) and then click **OK**.

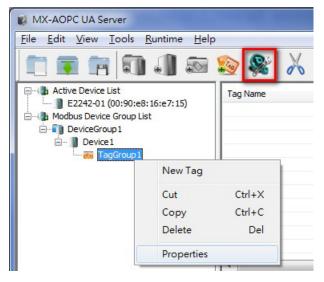
Tag Group Property				
Tag Group Name: TagGroup1				
OK Cancel				

3. The new tag group will be added to the device.



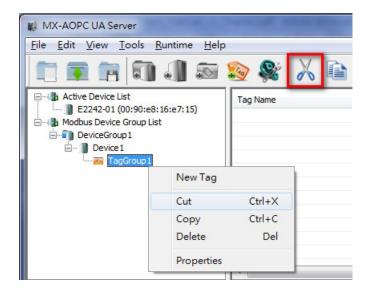
# **Editing a Tag Group**

Right click the tag group and then click **Properties** in the pop-up menu, or click the tag group to select it and then click the **Properties** icon on the Quick Launch toolbar.



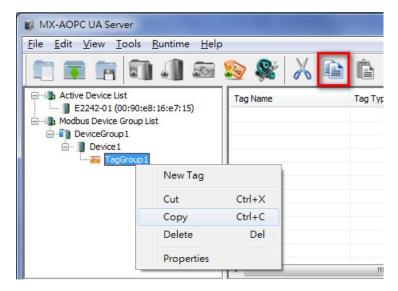
#### **Cutting a Tag Group**

Right click the tag group and click **Cut** in the pop-up menu, or click the tag group to select it and then click the **Cut** icon on the Quick Launch toolbar.



#### **Copying a Tag Group**

Right click the tag group and then click **Copy** in the pop-up menu, or click the tag group to select it and then click the **Copy** icon on the Quick Launch toolbar.



#### **Pasting a Tag Group**

Right click the Tag Group and then click **Paste** in the pop-up menu, or click the tag group to select it and then click the **Paste** icon on the Quick Launch toolbar.

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Active Device List E2242-01 (00 	:90:e8:16:e7:15) roup List L	Tag Group		Tag Name
	New Tag Group Move to Device G	iroup	•	
	Paste	Ctrl+'	V	
	Delete	Ctrl+I	D	
Date 1	Import Device Tag Export Device Tag		F	m
	Properties			

#### **Deleting a Tag Group**

Right click the tag group and then click **Delete** in the pop-up menu, or click the tag group to select it and then click the **Delete** icon on the Quick Launch toolbar.

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Active Device List     E2242-01 (00:9     Modbus Device Gro     DeviceGroup 1     Ovice1     TagGro	up List	Tag Name		Тад Туре
	New Tag	-		
	Cut Copy	Ctrl+X Ctrl+C		
	Delete	Del		
	Properties			
				III

## **Modbus Tags**

In this section we explain how to use the configuration console to add, edit, delete, and move a Modbus tag.

#### Adding a Modbus Tag to a Tag Group

 Right click the tag group that the Modbus tag will be added to and then click New Tag in the pop-up menu, or click the tag group to select it and then click the New Tag icon on the Quick Launch toolbar.

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	0:e8:5a:21:6e) 90:e8:21:b7:91)			
Modbus Device Group 1     DeviceGroup 1     Device1     Modbus Device1				
DeviceGroup1	oup1	Ctrl+X		
DeviceGroup1	Dup 1	Ctrl+X Ctrl+C		
DeviceGroup1	New Tag		1	

2. Edit the items in the **Tag Property** window as needed.

Function Code:	01: Rea	ad/Write Coils (0xxxx)
Access:	Read/W	rite
Tag Name:	Tag1	
Description:		
Start Address:	0	
Coil Length:	1	(1 to 2000)
Data Type:	Boolear	1
Start Number:	0	(0 to 99)
Data Conversion:	None	
Tag Quantity:	1	

- Function Code: Select the function code for this Modbus tag (options: 01: Read/Write Coils; 02: Read Discrete Inputs; 03: Read/Write Holding Registers; 04: Read Input Registers).
- > Address: Show Read/Write or Read-only attribute of this tag(s).

- **Tag Name:** The name of the Modbus tag (max. length = 30; "." is not allowed).
- > **Description:** Description of this Modbus tag (max. length = 25).
- > **Start Address:** Define the start address of this Modbus tag (0 to 65535).
- > Coil Length / Register Length: Define the length of the coil (1 to 2000) or the register (1 to 125).
- Data Type: Selecting the data type of this Modbus tag (options: Boolean; Unsigned short integer; Unsigned integer; Float).
- Start Number: Define the start number of the continuous coils or registers. The continuous coils or registers will be divided into different tags with unique name based on this number definition.
- > **Data Conversion:** Define the sequence of the High/Low Bytes or Words for the register(s).
- > **Tag Quantity:** Show the quantity of the tag(s).
- 3. Click the tag group to verify that the Modbus tag was added to this group.

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	The First Tag Name	The Last Tag Name	Tag Type	Function Code	Access	Start Address	Tag Qty	Data Type	Start Number	Data Conversion	Description
2542-01 (00:90:e8:5a:21:6e) E2242-01 (00:90:e8:21:b7:91)	🧐 Tag1		Polling	2	Read-only	0000	1	Boolean	0	None	
Modbus Device Group List	🥸 Tag2_0000	Tag2_0002	Polling	1	Read/Write	0007	3	Boolean	0	None	
DeviceGroup1											
🖻 📲 Device 1											
TagGroup 1	-										

#### Importing a List of Modbus Tags into a Modbus Device

To import a list of Modbus tags into a Modbus device, right click the Modbus device and then click **Import Device Tags (.csv)** in the pop-up menu. Select a csv file on your PC to import the tags listed in the csv file into the Modbus device. Refer to **Chapter 3: Configuration Console ( Menu Items ( File** for detailed csv file formats.



## Editing a Modbus Tag

Click the Modbus tag to select it and then click the **Properties** icon on the Quick Launch toolbar.

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Active Device List	The First Tag Name	The Last Tag Name	Tag Type	Function Code	Access
2542-01 (00:90:e8:5a:21:6e) E2242-01 (00:90:e8:21:b7:91)	🕸 Tag1		Polling	2	Read-only
Modbus Device Group List					
Device1					
TagGroup1					

#### **Deleting a Modbus Tag**

Click the Modbus tag to select it and then click the **Delete** icon on the Quick Launch toolbar.

ile <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>R</u> untime <u>H</u> elp					
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Active Device List	The First Tag Name	The Last Tag Name	Tag Type	Function Code	Access
2542-01 (00:90:e8:5a:21:6e)     2242-01 (00:90:e8:21:b7:91)     Modbus Device Group List     DeviceGroup1	🗞 Tagi		Polling	2	Read-only

# 6. License Registration, Activation and Transfer

Three versions of MX-AOPC UA Server are available. The trial version, which supports up to 30 connected devices, can be installed and used for 30 days without registration. To use the free and paid versions, you must submit a license registration. Both free and paid versions can be used indefinitely, but the free version only supports up to 30 connected devices. We summarize the three versions in the following table:

Version	Connected Devices	Run Time	License File
Trial	Up to 30	30 days	Not Required
Free	Up to 30	Unlimited	Required
Paid	Unlimited	Unlimited	Required

## **License Registration and Activation**

Take the following steps to register a license.

Step 1: Get the PC User Code from the MX-AOPC UA server's configuration console by clicking Help > License. For the paid version, you will need to purchase a registration code from your Moxa distributor. The registration code will send to your email address.

User Code				MOXA
User Code: License Status:	1613EB128766 Trial Version		1	Moxa license notification
Time Remaining:	11 days		1	Dear Customers,
rine reenaning.	1100/0			Thank you for purchasing our product.
		ОК		Your registration code type (MX-AOPC UA Server NEW)
				model name (MX-AOPC UA Server) is
				54F3TQZPLZV83UFMI2974774A0MNUJ, Please go to our
				activation portal

(https://netsecuritylicense.moxa.com/Product/Detail) to activate your purchased products.

After a successful activation, you can search your license and activation code as well as download the latest software, firmware and pattern updates on the activation portal. Step 2: Go to Moxa's website (<u>https://www.moxa.com</u>) and log in with your Moxa account and password, or apply for an account if this is your first visit to the site. Navigate to Support > Software License Management to access the license portal.

ΜΟΧΛ	Products	Solutions	Support	How to Buy	Contact Us   Partner Zone   About Us	My Moxa Sign In
Defend Yo	Product Support Software & Docume Product FAQs Security Advisories		Repair & Warranty Product Repair Servic Warranty Policy		Resources Literature Library Case Studies Article Library	
Networks	Software License Mi Software Life-cycle I Still need assistance	Policy	a product? CONTACT US	,		

Step 3: On the Software Licensing website, navigate to Products and Licenses > Activate a Product License. Select MX-AOPC UA Server from Product Type, then select Free Version from Sub Product Type and enter the User Code or select Paid Version and enter both the User Code and Registration Code.

Products and Licenses  Download	So
View Activated Products	
Activate a Product License	
	-
Request an add-on or renewal License	
Activate an add-on or renewal License	
Transfer a Product License	

Product Type	MX-AOPC UA Server	~
Sub Product Type	Free License	~
User code	Enter your user code	
		Activate

	Products and Licenses / Activate a Product License	
Product Type	MX-AOPC UA Server	~
Sub Product Type	Paid License	~
Registration Code	Enter your registration code	Product Type :
User code	Enter your user code	
		Activate

**Step 4:** Download the license file to a folder on your PC.

Message notification
Your license has been activated, please download the license file from below.
Download I know

**Step 5:** From MX-AOPC UA server's configuration console, click **Help** > **Licensing** > **Add License File** to add the license file (.lic) to MX-AOPC UA Server.

File Edit View Tools Runtime [	Help	
	Server Help	
	Licensing +	License Info
+ Active Device List	About	Add License File
Modbus Device Group List		Deactivate License

**Step 6:** After license activation is complete, go to **Help** > **License Info** to check the current license status.

ActiveOPC	×	User Code		×
🛕 Comple	te license activation.	User Code: License Status: Max. Device Count:	1613EB128766 Free Version 30	
	Finish			ОК
User Code		x		
User Code: License Status:	1613EB128766 Paid Version			
	O	<		

## **License Transfer**

You can transfer the Paid License to another device. Take the following steps.

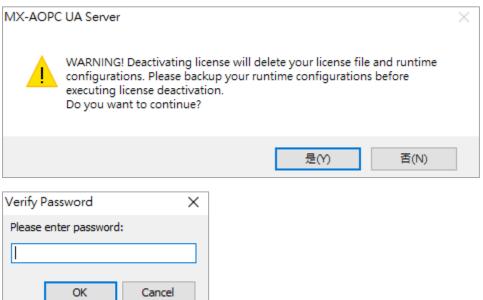
**Step 1:** Back up your runtime configuration from **File > Save / Save as**.

<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	<u>T</u> ools	<u>R</u> untime	<u>H</u> elp	
	New				Ctrl+N	
	Open.				Ctrl+O	
	Save				Ctrl+S	
	Save A	\s				ĥ

**Step 2:** From the MX-AOPC UA server's configuration console, click **Help > Licensing > Deactivate** License.

Help		
Server Help		
Licensing	>	License Info
About		Add License File
		Deactivate License

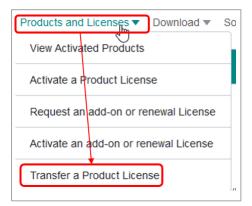
**Step 3:** There will be a warning message and password protection before deactivation.



**Step 4:** Get the deactivation code from the MX-AOPC UA server's configuration console by clicking **Help > License > License Info**.

License Info		$\times$
User Code:	05314B4AA8FF	]
Deactivation Code:	2606157176F3C93B560E6B0E	]
License Status:	Trial Version	
Time Remaining:	0 days	
	ОК	

Step 5: Go to the Software License Management website, navigate to Products and Licenses > Transfer a Product License.



**Step 6:** Choose MX-AOPC UA Server in Product Type, pick the license to be transferred, enter the deactivation code and the new user code. A new license file will be available to download.

Product Type	MX-AOP(	C UA Server V		
The license to be transferred	Search:			Show
				entries
	<b></b>	Registration Code	User code 🔶	Activation Date
	0	SY9395 6W4WN6JZRV4	07654B4AA8FF	5/24/2022 10:50:28 PM
	0	OBGLYOHANOZ102I 48	D19D628422DE	5/24/2022 10:58:08 PM
	0	NZC KOD36W8OS87HG5	05554B4AA8FF	6/3/2022 9:15:58 PM
	0	RF3621OV IM34XQB9G	D85A4CC0A7FC	5/24/2022 12:36:52 AM
	0	W4K55JFRW544XLF9C	02704B4AA8FF	5/24/2022 12:56:06 AM
	Showing 1 t	o 5 of 5 entries		
				Previous 1 Next
Deactivation Code	Enter you	r deactivation code		
New User Code	Enter you	r New User Code		

### **Port Usage**

Port	Туре	Usage
502	ТСР	Modbus Communication
53192	ТСР	Default UA Server Endpoint
9500	ТСР	Moxa AOPC protocol
9900	ТСР	Moxa AOPC protocol

## **Configuring DCOM Settings**

If the OPC client only supports the OPC Data Access (DA) standard, you will need to configure DCOM settings. Before launching MX-AOPC UA Server, configure the DCOM settings for your security policy.



#### NOTE

If the OPC Client and Server software are installed on different servers, the DCOM, WORKGROUP, System Account, and Password settings should be the same.

1. Go to the **START** menu and type **dcomcnfg** to activate the **Component Services** dialog box.

See more results	
dcomcnfg	X Shut down

2. Right click **My Computer** under **Console Root** (**Component Services** (**Computers**, and click **Properties** to open the **My Computer Properties** dialog box.



3. Click the **COM Security** tab and edit who is allowed by default to access, launch, or activate the applications or objects.

General	Options	Default Properties
Default Protocols	COM Secur	
Access Permissions		
	allowed default acces	s to applications. You ma
		e their own permissions.
A Caution: M	odifuina popose pormio	sions can affect the ability
	ons to start, connect, fi	
securely.		
	<b>- - - - - - - - - -</b>	
	Edit Limits	Edit Default
1000 C 1000 C 1000	20100	
Launch and Activation	Permissions	
	allowed by default to la	
	u may also set limits on	
activate objects. Yo determine their own	u may also set limits on permissions.	applications that
activate objects. Yo determine their own	u may also set limits on permissions. odifying launch and act	applications that tivation permissions can
activate objects. Yo determine their own	u may also set limits on permissions. odifying launch and ac ability of applications to	applications that
activate objects. Yo determine their own Caution: Maffect the a	u may also set limits on permissions. odifying launch and ac ability of applications to	applications that tivation permissions can
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activate objects. Yo determine their own Caution: Maffect the a	u may also set limits on permissions. odifying launch and ac ability of applications to securely.	applications that tivation permissions can start, connect, function
activate objects. Yo determine their own Caution: Maffect the a	u may also set limits on permissions. odifying launch and ac ability of applications to securely.	applications that tivation permissions can start, connect, function
activate objects. Yo determine their own Caution: Maffect the a	u may also set limits on permissions. odifying launch and ac ability of applications to securely.	applications that tivation permissions can start, connect, function
activate objects. Yo determine their own Caution: Maffect the a	u may also set limits on permissions. odifying launch and act ability of applications to securely. Edit Limits	applications that tivation permissions can start, connect, function
activate objects. Yo determine their own Caution: Maffect the a and/or run	u may also set limits on permissions. odifying launch and act ability of applications to securely. Edit Limits	applications that tivation permissions can start, connect, function

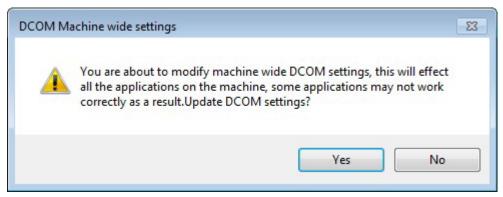
4. Add Everyone, INTERACTIVE, NETWORK, and SYSTEM, and set Allow permission to these groups.

Access Permission	? 🔀
Default Security	
Group or user names:	
& Everyone	
SELF	5.0
SYSTEM	
& NETWORK	
	Add
Permissions for Everyone	Allow Deny
Local Access	
Remote Access	
Learn about access control and	permissions
	OK Cancel
Launch and Activation Dermissio	2
Launch and Activation Permissio	n ? 🔀
Launch and Activation Permissio	n ? 💌
	on 🕄 🔀
Default Security Group or user names:	on ? X
Default Security Group or user names:	n 😨 💌
Default Security Group or user names: Everyone SYSTEM NETWORK	
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7)	
Default Security Group or user names: Everyone SYSTEM NETWORK	
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7)	Administrators)
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7)	
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7)	Administrators)
Default Security Group or user names: Strength Strength	Administrators) Add Remove
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7VA INTERACTIVE Permissions for Everyone	Administrators)       Add     Remove       Allow     Deny
Default Security Group or user names: Everyone SYSTEM NETWORK Administrators (IE11WIN7\A INTERACTIVE Permissions for Everyone Local Launch	Administrators)       Add     Remove       Add     Remove       Allow     Deny       V     Image: Constraint of the second secon
Default Security Group or user names: SYSTEM NETWORK Administrators (IE11WIN7\A INTERACTIVE Permissions for Everyone Local Launch Remote Launch	Administrators)       Add     Remove       Add     Remove       Allow     Deny       Image: Constraint of the second
Default Security Group or user names: SYSTEM SYSTEM Administrators (IE11WIN7VA INTERACTIVE Permissions for Everyone Local Launch Remote Launch Local Activation	Administrators)       Add     Remove       Allow     Deny       Image: Constraint of the second secon
Default Security Group or user names: SYSTEM SYSTEM Administrators (IE11WIN7VA INTERACTIVE Permissions for Everyone Local Launch Remote Launch Local Activation	Administrators)       Add     Remove       Allow     Deny       Image: Constraint of the second secon
Default Security Group or user names: SYSTEM SYSTEM Administrators (IE11WIN7VA INTERACTIVE Permissions for Everyone Local Launch Remote Launch Local Activation	Administrators)       Add     Remove       Allow     Deny       Image: Constraint of the second secon
Default Security         Group or user names:         Image: System         System         NETWORK         Administrators (IE11WIN7VA         INTERACTIVE         Permissions for Everyone         Local Launch         Remote Launch         Local Activation         Remote Activation	Administrators)
Default Security Group or user names: SYSTEM SYSTEM Administrators (IE11WIN7VA INTERACTIVE Permissions for Everyone Local Launch Remote Launch Local Activation	Administrators)
Default Security         Group or user names:         Image: System         System         NETWORK         Administrators (IE11WIN7VA         INTERACTIVE         Permissions for Everyone         Local Launch         Remote Launch         Local Activation         Remote Activation	Administrators)

5. Click the **Default Properties** tab and check if the settings are the same as shown in the screenshot below.

	0011.0		HODTO	
Default Protocols	COM Secu		MSDTC	
General	Options	Dera	ault Properties	
Enable Distributed (	COM on this computer			
Enable COM Interne	et Services on this com	puter		
Default Distributed CO	OM Communication Pro	perties		
The Authentication L	evel specifies security	at the pack	et level.	
Default Authenticat	tion Level:			
Connect	IION LEVEL	_		
Connect		•		
who is calling them, a using the client's ider	and whether the applica ntity.			
who is calling them, a using the client's ider Default <u>I</u> mpersonat Identify	and whether the applicantity.	ation can de	o operations	
who is calling them, a using the client's ider Default <u>I</u> mpersonat Identify Security for reference	and whether the applica notity. ion Level: tracking can be provi	etion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is n	tion can de tion can de t	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in	and whether the applica notity. ion Level: tracking can be provi	tion can de tion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is n	tion can de tion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is n	tion can de tion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in Provide addition	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is no nal security for referenc	tion can de tion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is no nal security for referenc	tion can de tion can de	o operations	
who is calling them, a using the client's ider Default Impersonat Identify Security for reference and that the default in Provide addition	and whether the applica ntity. ion Level: tracking can be provi mpersonation level is no nal security for referenc	tion can de tion can de	o operations	

6. Click **Yes** when the following warning message appears.



7. Go back to the **Component Services** dialog box, and right click **MOXA\_ACTIVE\_OPC\_SERVER** under **Console Root** ( **Component Services** ( **Computers** ( **My Computer** ( **DCOM Config**, and then click **Properties**.

Component Services	
🧆 File Action View Window Help	
🔶 🤿 🙋 📰 🗙 🗐 🙆 👘 🏥	
Microsoft WMI Provider St	ubsystem Se 🔺
Microsoft.Aspnet.Snapin.A	AspNetMani
MLICCTToMET	
MMC Application Class	
ModuleBrowseInfo	1000 m
MOXA_ACTIVE_OPC_SERV	/ER
MSDAINITIALIZE	View 🕨
MsRdpSessionManager	New Window from Here
MSTTS DecObj Class St	
NAP Agent Service	Properties
Nap Elevated COM class	
NCLUA	Help
D 🚔 NDFAPI	

8. Click the **General** tab, and set the **Authentication Level** to **Connect**.

AOXA_AC	TIVE_OPC_SE	RVER Properties			
General	Location Se	curity Endpoints Identity			
Gene	al properties of	this DCOM application			
Appl	ication Name:	MOXA_ACTIVE_OPC_SERVER			
Appl	ication ID:	{6cbf6ab8-1ba8-4a2b-8b92-554d29d378f9}			
Appl	ication Type:	Local Service			
Auth	entication Leve	el: Connect			
Serv	ice Name:	MOXA_MX-AOPC_UA_SERVER			
Leamm	iore about <u>settir</u>	ig these properties.			
		OK Cancel <u>Apply</u>			

9. Click the **Security** tab. You may either apply the default settings of Access, Launch, and Activation Permissions to the MX-AOPC UA Server or customize the permission settings. If you would like to customize the settings, make sure that **Everyone**, **INTERACTIVE**, **NETWORK**, and **SYSTEM** are added, and the permission for these groups is set to **Allow**.

MOXA_ACTIVE_OPC_SERVER Properties	? 🔀
General Location Security Endpoints Identity	
Launch and Activation Permissions	
Our See Default	
Customize	Edit
Access Permissions	
Ose Default	
Customize	Edit
Configuration Permissions	
🔘 Use Default	
Customize	Edit
Leam more about <u>setting these properties</u> .	
ОК Са	ncel Apply

10. Click the **Identity** tab and make sure **The system account** is selected. Now DCOM is ready to accept all incoming connections.

General	Location	Security	Endpoints	Identity		
Which	user accour	nt do you v	vant to use to	o run this ap	oplication	2
🔘 The	interactive	user.				
The	launching	user.				
This	user.					
User:					[	Browse
Pass	word:	ſ				
Confi	rm passwor	d: [				
The	system acc	count (serv	ices only).			
Leam n	nore about s	setting thes	e properties.	8		