Moxa Technical Support Team <u>support@moxa.com</u>

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About Moxa

Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems. Information about Moxa's solutions is available at www.moxa.com. You may also contact Moxa by email at info@moxa.com.

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Everyone has heard the old adage, "garbage in, garbage out," but the reality is that ensuring the quality and integrity of big data is not particularly easy. A cause for concern is the inevitable unexpected connection interruptions that plague any network, and which could result in data loss and expensive shutdowns of important business processes. Moxa's smart data acquisition method ensures data completeness by shrinking the amount of data that needs to be transmitted.



With the automatic data supplement function, after each network reconnection, MX-AOPC UA Logger will compare historical data stored on the SD cards located in individual Moxa ioLogik 2500 devices with the real time data it has already stored locally, and then supplement any missing data by requesting that the devices retransmit the lost data.

Moxa Tech Note

Ensure Data Completeness with Data Supplement's Auto Mode, on Demand, and on Schedule



We should point out, however, that automatic data supplement could fail due to unstable network conditions or a failure to access the database. To help avoid these problems, MX-AOPC Logger supports "on demand" and "on schedule" data supplement to allow users to manually trigger data supplement at any time or specify a fixed time for Logger to automatically execute a data supplement every day.

In this tech note, we illustrate how to set up different data supplement methods: automatic, on-demand, and on-schedule. For demonstration purposes, data supplement is implemented by exporting the data to an Excel file. To further understand how to build a public cloud-based solution, check the following links:

Tech note for public cloud-based solutions: http://www.moxa.com/support/sarch_result.aspx?prod_id=3049&type_id=7&type=doc_

Tech note title:

How to Build a Public Cloud with MX-AOPC UA Server and Logger

Prerequisites for data completeness solution:

- 1. ioLogik 2500 series device with SD card
- 2. MX-AOPC UA Server & UA Logger software
- 3. IOxpress software

Only three steps are required to finish setting up the data supplement methods:

- Step 1. Install MX-AOPC UA Server & UA Logger on your PC
- Step 2. Configure you Moxa I/O device to send properly configured tags to MX-AOPC UA Server

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- Step 3. Configure MX-AOPC UA Server and Logger to implement one of the following functions:
 - 1. Automatic data completeness
 - 2. On-demand data supplement
 - 3. On-schedule data supplement

1 Install MX-AOPC UA Server and Logger on your PC

The MX-AOPC UA Server and MX-AOPC UA Logger software can be downloaded for free from Moxa's website at the following software download page: http://www.moxa.com/product/MX-AOPC_UA_Suite.htm

Latest software versions:

- MX-AOPC UA Server v2.0
- MX-AOPC UA Logger v2.0

Refer to the user's manuals for MX-AOPC UA Server and MX-AOPC UA Logger for step-by-step installation instructions:

http://www.moxa.com/support/sarch_result.aspx?prod_id=3049&type_id=7&type=doc

User's manual titles:

- MX-AOPC UA Server User's Manual
- MX-AOPC UA Logger User's Manual

2 Configure your ioLogik 2500 device to send tags to MX-AOPC UA Server

To configure your ioLogik 2500 device, IOxpress can be downloaded for free from Moxa's website:

Software download page:

https://www.moxa.com/support/sarch_result.aspx?prod_id=4133&type_id=5&type=soft

Latest software versions:

• IOxpress Configuration Utility v2.1

Refer to the user's manuals of ioLogik 2500 on how to configure the device to send tags to MX-AOPC UA Server.

User's manual download page:

https://www.moxa.com/support/sarch_result.aspx?type=doc&prod_id=4133&type_id=7

User's manual titles:

• ioLogik 2500 User's Manual

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3 Configure MX-AOPC UA Server and Logger

Step 1. Run MX-AOPC UA Server from your PC's start menu, and then click the "Get Configuration from Server" icon on the menu bar. Devices that are uploading tags to the server will be listed in the left panel, and the tags you configured in Step 2 above will be listed in the right panel.

K MX-AOPC UA Server		Concerning States		
File Edit View Tools Runtime Help				
📋 👅 📻 🗊 🗊 📾 📚 😵 🗸	X 🖻 🖻 🔐	🧿 🖉 💐		
	Tag Name	Data Type	Access Rights	Description
AOPC-01 (00:90:e8:00:11:28)	🁒 Server 00.DI-00	Boolean	Read-only	Desc
Modhus Device Group List	👒 Server 00.DI-01	Boolean	Read-only	Desc
DeviceGroup1	🧐 Server 00.DI-02	Boolean	Read-only	Desc
	🧐 Server 00.DI-03	Boolean	Read-only	Desc
	🧐 Server 00.SysMAC	String	Read-only	Device MAC Address
	👒 Server 00.SysIPAddress	String	Read-only	Device IP Address
	👒 Server 00.SysConnect-00	Boolean	Read-only	System Connection

Step 2. Run MX-AOPC UA Logger from your PC's start menu, and then click **Help** \rightarrow **Logger Help** from the top menu bar. Follow the instructions in the "Server Management" section to connect MX-AOPC UA Logger to MX-AOPC UA Server.



Step 3. Click the "Connect" button on the menu bar to connect to MX-AOPC UA Server.

MX-AOPC UA Logger	the sum has been seen at a	and the local diversion of
<u>File Server Logger Tools Runtime Help</u>		
🛑 🖬 🖬 🖡 🚺 🚺 🖓 🕷 🖬 🖉		
	Server Endpoint: opc.tcp://192.168.127.25:5319	2/MXAOPC/UAServer
	Security Policy: None	
	Security Mode: None	
	Subscription Settings	Monitored Item Settings
	Publish Interval: 1000 ms	Sampling Interval: 500 ms
	Keep Alive Count: 10	Queue Size: 10
	Lifetime Count: 1000	Discard Oldest: Yes

Step 4. Click the "Help" menu and follow the instructions in the "Logger Management" section to create a logger to send the tags to a local Excel file.

MX-AOPC UA Logger		And the second s	😭 MX-AOPC UA Logger Help	
Server Logger File Server Cogler Totals Runtime Het Server Group Server (192.168.127.100:5319.c)	P Logger Help Licensing About Server Endpoint: Security Polcy: Security Mode: Subscrption Settings Publish Interval: Keep Alve Count:	opc. tep://192.168.127.100/53192/MACPC/LAS None None 1000 ms Samping Ir 10 Que	MX-AOPC UA Logger Help Md Back Phrt Options Contents Index Search MX-AOPC UA Logger Help MX-AOPC UA Logger Help Chindbaction MX-AOPC UA Logger Help Chindbaction MX-AOPC UA Logger Help MX-AOPC He	Logger Group In this section we explain how to use the configuration console to add, edit, and delete logger groups. Adding a Logger Group to a Logger Group List Ensure the runtime service is stopped Right click the Logger Group Jist and then click New Logger Group List and then click the Logger Group List to select it and then click
El Logger Group List Contacto	Security Mode: Subscrption Settings Publish Interval: Keep Alve Count: Lifetime Count:	None Monitored ID 1000 ms Sampling Iz 10 Que: 1000 Discard	Configuration Console Configuration Console Configuration Console Configuration Console Configuration Configurati	 In this section we explain how to use the configuration console to add, edit, and delete logger groups. • Adding a Logger Group to a Logger Group List 1. Ensure the runtime service is stopped 2. Right click the Logger Group List and then click the Logger Group List to select it and then click the Logger Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select it and then click the New Tag Group List to select the toolbar.

Moxa Tech Note

Ensure Data Completeness with Data Supplement's Auto Mode, on Demand, and on Schedule

ogger Name	Logger 1	
	(max. lenç	gth = 30; only 20 if using Oracle Database)
Excel	=ile:	
Root	Path:	C:\Users\Public\Documents\Moxa\MXAOPCLogger\Logger
File s	eparated ev	erv 60 min. (default: 60)
Access	File:	
Root	Path:	C: \Users \Public \Documents \Moxa \MXAOPCLogger \Logger \
🔘 Datab	ase:	
Source	e Name:	Setting
Azure	IoT:	
Conn	ection String	1:

Step 5.1 Automatic data supplement setting

Click **Tools** \rightarrow **Data Supplement Settings** from the top menu bar. Click "Data supplement after network reconnection" to activate the automatic data supplement function.

MX-AOPC UA Logger	The second se
<u>File</u> Server Logger <u>Tools</u> Runtime <u>H</u> elp	
Data Supplement Settings Certificate Management	
B- Server Group	Data Supplement Settings
Server Group Server 1(15 Change Password Options Change Group List Logger Group 1 Logger 1	Data Supplement Settings General Settings Retry Timeout 30 sec(s) (5 to 600, default: 30) Retries 3 Triggering Event Vata supplement after network reconnection Data supplement on schedule Everyday at 15:40 Data loss in the past Data loss in the past Data supplement through Cellular Data Access IP Address 0 Port 9400 Folder for supplementary data Path C:\Users\Public\Documents\Moxa\MXAOPCL City Cancel

Note: Data Supplement Settings can only be modified when the logger stops recording, and the data supplement process can be performed when the logger is recording.

Step 5.2 Click the "Help" menu and follow the instructions in "Testing the Data Supplement Function" section to test the automatic data supplement function.



Step 6.1 On demand data supplement setting

To trigger the data supplement process manually, click the "Data Supplement on Demand" button.



Step 6.2 Once the on-demand data supplement function has been triggered, the Logger icon will flash pink and gray light, indicating that the logger is performing the data supplement process. The progress of the data supplement process can be seen in the event log.

- St Logger G	roup List erGroup1 .ogger1]				
Date	Time	Event		*		
2018/03/26	19:33:30	Connecting to the dev	rice [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/26 08:51:40 to 2018/03/26 08:52:			
2018/03/26	19:33:30	No data found [from 2	No data found [from 2018/03/26 08:49:27 to 2018/03/26 08:51:13] from the device [MAC:00-90-e8-5f-10-a8] for sup;			
2018/03/26	19:33:28	Connecting to the dev	Connecting to the device [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/26 08:49:27 to 2018/03/26 08:51::			
2018/03/26	19:33:28	No data found [from 2	2018/03/25 11:33:24 to 2018/03/26 08:48:58] from the device [MAC:00-90-e8-5f-10-a8] for sup)¢		
2018/03/26	19:33:26	Connecting to the dev	Connecting to the device [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/25 11:33:24 to 2018/03/26 08:48:			
2018/03/26	19:33:26	Trying to connect to t	Trying to connect to the device.			
2018/03/26	19:33:26	Data supplement (Der	Data supplement (Demand) begin.			
2018/03/26	19:33:16	LoggerGroup 1.Logger	1 sucessfully connected to database!			
2018/03/26	19:33:16	Initializing database				
2018/03/26	19:33:14	MX-AOPC UA Logger	runtime service is running.			
2018/03/26	19:33:01	Data supplement (Der	nand) end.			
2018/03/26	19:33:01	MX-AOPC UA Logger	runtime service is stop.			
2018/03/26	19:32:52	No data found [from 2	2018/03/26 09:11:24 to 2018/03/26 10:12:58] from the device [MAC:00-90-e8-5f-10-a8] for sup	н т		
Service Status : R	lunning	Time: 19:33:30	Data Supplement Queue: 0000			

Step 7.1 On schedule data supplement setting

Click **Tools** \rightarrow **Data Supplement Settings** from the top menu bar. Click "Data supplement on schedule" and specify the time and period; the data supplement process will start at the specified time.

MX-AOPC UA Logger	1 M				(Constant)
<u>File</u> <u>Server</u> Logger <u>T</u> o	ols <u>R</u> untime <u>H</u> elp				
	Data Supplement Settings	A 0 0	8888	1	
	Certificate Management			, 	
Server Group	System Log 🔸	Data Supplement Sett	ings		
	Change Password	General Settings			
	Options	Retry Timeout	30	sec(s) (5 to 600, default: 30)	
□- 😝 Logger Group List		Retries	3	(0 to 10, default: 3)	
E-E LoggerGroup1		Triggering Event			
Cogger 1		☑ Data suppleme	ent after network reconnection		<u>^</u>
		Data supplement	ent on schedule		=
		Everyday at	15:40		
		Data loss in t	ne past 1 dav(s) (1 t	to 7. default: 1)	
1					
		🔲 Data suppleme	ent through Cellular Data Access		
		IP Address	0.0.0.0		
		Port	9400	(0 to 65535, default: 9400)	
		Folder for supplem	nentary data		
		Path	C:\Users\Public\Documents\Mo	Dxa\MXAOPCLi 💿 🔳	
		Log Folder for Dat	ta Supplement on Demand		
			C: \Users\Public\Documents\Mo	DXa\MXAOPCL	
				OK Cancel	
		(C			

Step 7.2 After the on-schedule data supplement process is complete, the event log will show how long the data supplement process took to perform and display the result of the supplement process.

E- St Logger Gr	roup List erGroup1 ogger1			
Date	Time	Event		*
2018/03/26	19:37:32	No data found [from 2018/	(03/26 08:51:40 to 2018/03/26 08:52:00] from the device [MAC:00-90-e8-5f-10-a8] for sup	
2018/03/26	19:37:30	Connecting to the device [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/26 08:51:40 to 2018/03/26 08:52:	
2018/03/26	19:37:30	No data found [from 2018/	(03/26 08:49:27 to 2018/03/26 08:51:13] from the device [MAC:00-90-e8-5f-10-a8] for sup	4
2018/03/26	19:37:28	Connecting to the device [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/26 08:49:27 to 2018/03/26 08:51:	
2018/03/26	19:37:28	No data found [from 2018/	(03/25 11:37:00 to 2018/03/26 08:48:58] from the device [MAC:00-90-e8-5f-10-a8] for sup	4
2018/03/26	19:37:27	Connecting to the device [MAC:00-90-e8-5f-10-a8] for retrieving log from 2018/03/25 11:37:00 to 2018/03/26 08:48:	4
2018/03/26	19:37:26	Trying to connect to the de	evice.	
2018/03/26	19:37:26	Data supplement (Schedule	e) begin.	
2018/03/26	19:36:25	LoggerGroup 1.Logger 1 suc	essfully connected to database!	1
2018/03/26	19:36:25	Initializing database		
2018/03/26	19:36:23	MX-AOPC UA Logger runtin	ne service is running.	
2018/03/26	19:35:44	MX-AOPC UA Logger runtin	ne service is stop.	
2018/03/26	19:34:25	Data supplement (Demand) end.	Ψ.
	11		•	
Service Status : R	unning Tin	ne: 19:39:25	Data Supplement Queue: 0000	H

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