Startup guide for OMRON PLCs with Sysmac Studio

This introduction was created with Sysmac Studio V1.1.7.20 and the Network Configurator V3.61 for EtherNet/IP.

- 1. Connect your network devices and select the connection type to your PLC in Sysmac Studio. Refer to the manuals you can get a description for the establishment of a connection to a PLC.
- 2. Create a Sysmac Studio Project and configure the network parameters of your PLC. Set the IP address in the port settings of the EtherNet/IP interface (e.g. 192.168.1.12):



3. Set the IP address of the LioN-P module with the rotary switches. If the first three octets have to be changed use the webserver to change the default configuration.

 Use the Network Configurator to set up the EtherNet/IP connections and install the EDS files (EDS File Menu → Install):



 Select the PLC (Hardware List → EtherNet/IP Hardware → Device Type → Communications Adapter → e.g. NX701 with double-click) and set its IP address (rightclick on the PLC icon → Change Node Address → New IP Address e.g. 192.168.1.12):

LioN-P_EIP_IOL_Startup_Guide - Network Config	urator		_	
File Edit View Network Device EDS File	Tools Option Help		1.5	
🗅 🚅 🖬 豊 🌷 🌆 🍇 🍇 🦦 🐝	🎸 🎒 🏌 🖻 🖻 🗙 🔩	81 🕅 🏛 🖏 🕅	Ð	
🐔 🛢 🖬 🖬 📥 🗢 🗹 📾 # #				
	EtherNet/IP_1			
Network Configurator	Comment	#	##	Vendor
Vendor Generations Adapter Generations Adapter Generations Adapter Generations Generation Generation Generation Generation Generation	Change IP Address	192.168.250		OMRON Corporation
Generic Device DeviceType Generic Device DeviceType Generic State Solutions Adapter Generic Device Generic Device Solutions Adapter Generic Device Gen	New IP Address :	192 . 168 1 . Cancel	. 12	

 Select the LioN-P module (Hardware List → EtherNet/IP Hardware → Vendor → Lumberg, a Belden brand → Communications Adapter → e.g. 0980 ESL 399-121 IOL M12P MP with double-click) and set its IP address (right-click on the module icon → Change Node Address → New IP Address e.g. 192.168.1.3):



7. Edit the device parameters of the LioN-P module (double-click on the module icon) and set the port configurations (e.g. IO-Link on Port 1):

arameters		
Parameter Name	Value	
0034 Digital IO Mode Port 5 Channel B	Auxiliary Power	6
0035 Digital IO Mode Port 6 Channel B	Auxiliary Power	
0036 Digital IO Mode Port 7 Channel B	Auxiliary Power	
0037 Digital IO Mode Port 8 Channel B	Auxiliary Power	
0040 Fail Safe Value DO Mode Port 1 Ch. B res	0	
0041 Fail Safe Value DO Mode Port 2 Ch. B res	0	
0042 Fail Safe Value DO Mode Port 3 Ch. B res	0	
0043 Fail Safe Value DO Mode Port 4 Ch. B res	0	
0053 IOL Port 1 Configuration	IO-Link	•
0054 IOL Port 2 Configuration	DI	
0055 IOL Port 3 Configuration	DI	
0056 IOL Port 4 Configuration	DI	
0057 IOL Port 5 Configuration	DI	
0058 IOL Port 6 Configuration	DI	
0059 IOL Port 7 Configuration	DI	
0060 IOL Port 8 Configuration	DI	
0062 IOL Port 1 Parameter Storage	Disabled	
0063 IOL Port 1 Validation	No Validation	
0064 IOL Port 1 Vendor ID (MSB)	<u>n</u>	
0053 IOL Port 1 Configuration Default : DI New Help String		
		Reset
Default Setup	Expand All	Collapse All

8. To assign some tags to the process data of the LioN-P module it is recommended to create Global Variables in Sysmac Studio which can be transferred to the Network Configurator. Select in Sysmac Studio the Multiview Explorer → Programming → Data → Global Variables with double-click and create each a tag for the input and output data direction of the LioN-P module (e.g. LioNP_IOL_IN with 46 bytes for input assembly 103 and LioNP_IOL_OUT with 4 bytes for output assembly 100):



- Export the Global Variables (Tools Menu → Export Global Variables → Network Configurator) and save the CSV file to a known folder (e.g. OMRON_Global_Variables.csv)
- 10. Go Online A with the PLC and transfer the project with the EtherNet/IP connection settings to the Controller 🔜:



11. To realize the process data exchange over the tags you have to import the created CSV file in the Network Configurator (double-click on the PLC icon \rightarrow Tag Sets \rightarrow To/From

File \rightarrow Import from File \rightarrow e.g. OMRON_Global_Variables.csv). The tags for the Global Variables are shown in the direction tabs:

Name	Fault	Size Bit	ID
缙LioNP_IOL_IN		46Byte	Auto
New Edit Delete		Expand All	Collapse Al

12. Following you have to register the EtherNet/IP connections in the PLC. Click Connections tab, select the LioN-P module and register 🕩 the device:

Tag Jeta			
Unregister Device List			
#	Product Name		
Connections : 0/256 (O	: 0, T : 0)		
register Device List			
Dearburgh Minima		100 100 1 10 NV701 Verable	Tourse Managhta
Product Name	0000 FOL 200 131 IOL N130 NB	192.168.1.12 NX701 Variable	Target Variable
Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
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Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
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Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
Product Name	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
Product Name 192.168.1.3 (#003)	0980 ESL 399-121 IOL M12P MP	192.168.1.12 NX701 Variable	Target Variable
Product Name 192.168.1.3 (#003) New Edit	0980 ESL 399-121 IOL M12P MP III Delete Edit Al	192.168.1.12 NX701 Variable	Target Variable

13. Edit the EtherNet/IP connection and link the assemblies with the tags (double-click on the registered LioN-P module). Choose a Connection I/O Type or select the tag and assembly each for both directions, set the RPI time, register Regist the connections and close the window:

Connection I/U Type : Status/Ltfl	Tarrah Davier
Node Address : 192.168.1.12 Comment : NX701 Input Tag Set : Edit Tag Sets	Node Address : 192.168.1.3 Comment : 0980 ESL 399-121 IOL M12P Output Tag Set :
Connection Type : Multi-cast connection	(Input_103 - [46Byte] -
Output Tag Set : Edit Tag Sets LioNP_IOL_OUT - [4Byte] Connection Type : Point to Point connection	Input Tag Set : Output_100 - [4Byte]
Hide Detail	
Packet Interval (RPI) : 50.0 ms (0.5 - 10000.0 ms	
Timeout Value : Packet Interval (RPI) x 4	Connection Name : (Possible to omit)
Connection Structure	

14. The configured connections are shown in the Register Device List:

onnections Tag Sets			
Unregister Device List			
#	Product Name		
Connections · 2/256 (C)-2 T·0)		
Register Device List			
Product Name		192.168.1.12 NX701 Variable	Target Variable
🏈 192.168.1.3 (#003)	0980 ESL 399-121 IOL M	112P MP	
default_001 [Inp	ut]	LioNP_IOL_IN	Input_103
default_001 [Ou	tput]	LioNP_IOL_OUT	Output_100
		m	
*[•
< Edit	Delete Ed	III it All Change Target Node ID	To/From File

15. The detailed view IIII in the Network Configurator shows the dependency between PLC and the LioN-P module:



16. Establish the connection ≡ to the PLC, download the network structure ★ and ignore the wrong device comment for the LioN-P module:

0	Comparison Result of Network Structure					
	The network may be another network because the structure of network is not match. Would you like to continue the download to the network?					
	Description Local Networ					
	Wrong device comment. (192.168.1.3)	0980 ESL 399-121 IOL	0980 E			
	•		•			
	Yes No					

17. Now the process data exchange has to run. Use the device Monitor of the PLC to check the connection status (right-click on PLC icon \rightarrow Monitor \rightarrow Connection):

Monitor Device			X
Status 1 Status 2 Connection Controller	· Log Tag :	Status Ethernet	Information
Start Connection Stop Connection Connection Status Connection Name 192.168.1.3 (#003) default_001	Type Out/In	Status 00:0000	
			Close

18. You can show the process data of the LioN-P module with a watch table in Sysmac Studio:



19. Use the webserver to show the port status and get details about the IO-Link sensors.

LION-P Webserver		_					
Home Status	Ports	System	1	<u>User</u> <u>Co</u>	ontact		
Status							
Device Overview	Devio	ce Information	u.				
	Nam	e		0980 ESL 399-12	1		
1 101	Bus)		ON			
	Devi	ce Diagnosis					
	10-Li	nk Master Dia	gnosis				
	Force	emode		Forcemode off	Switch on		
	Port	Information					
	Port	Type	Pin / Channel	Function	State	Dia	Details
		IO-Link	4/A	IO-Link 1 Bytes In, 1 Bytes Out	Operate		0
		Class A + DI	2/B	Digital Input 1 Bit In / NO	ON		
		IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		
		Class A + DI	2/B	Digital Input 1 Bit In / NO	OFF		
		IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		
	/ A3	Class A + DI	2/B	Digital Input 1 Bit In / NO	OFF		
		IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		
		Class A + DI	2/B	Digital Input 1 Bit In / NO	OFF		
	X5	IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		0
		Class B + DO	2/B	AUX Power			1000
	X6	IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		0
		01235 0 1 00	2/B	AUX Power	-		
	X7	IO-Link	4/A	Digital Input 1 Bit In / NO	OFF		(j)
			2/B	AUX Power			
	X8	IO-Link Class B + DO	4/A	Digital Input 1 Bit In / NO	OFF		٥
	1996		2/B	AUX Power			