Product Application Note

Adding an Motoman NX100 Robot Controller as an EIP Adapter to MP2300Siec Machine Controller

Applicable Product(s):

- MP2300Siec, MP2310iec (Firwmare 1.1.1.4 or later)
- MotionWorks IEC Express/Pro (v 1.1.1.7 or later)
- Motoman NX100 Robot Controller
- Motoman EtherNet/IP (PCU-ETHIO) PCI Interface card (P/N154310-1)

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Application Overview

This application note illustrates how to add an Motoman NX100 Robot Controller to an MP2300Siec motion controller as an EIP Adapter. Additionally, a detailed description of how to create and link I/O variables in the MotionWorks IEC project is provided.

Application Requirements

The requirements for this application note include using the MP2300Siec motion controller as an EIP Scanner (Master) device to talk to and exchange data with a Motoman NX100 Robot Controller Adapter (Slave). The example explained in this note describes an implicit I/O message connection between the MP2300Siec and the Motoman NX100. No function blocks or PLC logic is necessary, since the data connection is open once the Assembly instances are correctly configured.

Components:

- MP2300Siec Controller
- Motoman NX100 Robot Controller
- Motoman EtherNet/IP (PCU-ETHIO) PCI Interface card (P/N154310-1)

Application Solution and Benefits:

This configuration will allow the user to exchange data between the Motoman NX100 Robot Controller and the MP2300Siec Motion Controller using EIP as the protocol. It will allow connectivity between the MP2300Siec and a third party PLC using EIP. Both Input and Output data tags are supported.

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Implementation Method of Core Operation

This example includes configuration of the EIP Module and the necessary configuration for the EIP Assembly instances on both the MP2300Siec device (Scanner) and the Motoman NX100 Robot Controller device (Adapter).

Step 1: Configure the Motoman NX100 Robot Controller as an Ethernet/IP Adapter

The First step to adding the Motoman NX100 Robot Controller as an Ethernet/IP Adapter in the MP2300Siec configuration is Launch the configuration tool within MotionWorksIEC. Be sure to upload the current configuration in to the project from the controller prior to beginning. Ethernet/IP Adapters must be added while "Offline." Right-Click on Ethernet/IP in the TCP/IP Settings tree and select "Add Device." Click "Finish" on Add Device dialogue that appears next



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₽ , ⊕ € Q 2	Save Mo	ove Log Ope		dd Device				
📈 📕 Module Configura	tion							
 Motoman MyMachine Mechatro 	link-ll		Se P E	elect Device 'art # IP Slave	Part Name EIP Slave	Manufacturer	Description EtherNet/IP	Slave Devic
	Rotary · Rotary · ettings	- 1 - 2					•	
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Figure #1: Adding a device

Input the following EtherNet/IP adapter configuration information:

- Name (Logical Name for the Adapter (Slave) device)
- IP Address (NX100 IP Address)
- I/O Group Name (Must be 7 characters or less)
- Select the I/O task to associate the update with (MotionWorksIEC Pro Only)
- Declare a Status Variable for the device
- Add a **Comment** about the device if desired.

🖶 Add EtherNet/IP Adapter 🛛 🗖 🔀				
Name	Motoman N×100 Adapter			
IP Address	192.168.0.10			
1/O Group	N×100			
Task	IOTask 💌			
Status Variable	NX100_Status			
Comment	Motoman NX100 Ethernet/IP Adapter (Slave)			
	OK Cancel			

Figure #2: Configuration Ethernet/IP Adatper.

Step 2: Configure the Motoman NX100 Robot Controller adapter input, output, and configuration instances.



Click on the newly created Adapter (slave) device in the Ethernet/IP tree.

SGDV Rotary - 1	Motoman NX100 Adapter	
TCP/IP Settings	I/O Assembly Instances	
Motoman NX100 Ade	Type Instance # Size (bytes) Update Interval (ms) Ownership Pr	iority Connection Use Run Idle
Modbus/TCP		
Counter	A	dd Input/Output Assembly Instance
	Configuration Assembly Instance	
	Type Instance # Size (bytes) Optional Data (hexadecimal)	
	Ad	d Configuration Assembly Instance

Figure #3: Motoman NX100 Adapter instance configuration

Click on Add Input/Output Assembly Instance. First configure the Input instance assembly as shown below, then Click "Add."

Add EtherNet/IP Assembly		
Assembly 💿 Input 🤇) Output 🔲 Use Run Idle	
Instance #	Ownership	
200	Exclusive 🗸	
Size (bytes)	Priority	
24	Scheduled 💌	
Update Interval (ms)	Connection Type	
50	Multicast 🗸 🗸	
	Add Cancel	

Figure #4: Input Assembly instance configuration

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Click on Add Input/Output Assembly Instance once again. Configure the Output instance assembly as shown below, then Click "Add."

Add EtherNet/IP Assembly		
Assembly 🔿 Input	💿 Output 🛛 Use Run Idle	
Instance #	Ownership	
100	Exclusive 🗸	
Size (bytes)	Priority	
24	Scheduled 🗸	
Update Interval (ms)	Connection Type	
50	Point to Point 🛛 🗸	
	Add Cancel	

Figure #5: Output Assembly instance configuration

Lastly, Click on Add Configuration Assembly Instance. Configure the Output instance assembly as shown below, then Click "Add."

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Add EtherNet/IP Assembly
Type 💿 Config
Instance #
50
Size (bytes)
q
Optional Data (hexadecimal)
Add

Figure #5: Configuration Assembly instance configuration

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The completed configuration should look like this:

Motoman NX100 Adapter									
1/0	I/O Assembly Instances								
	Туре	Instance #	Size (bytes)	Update Interval (ms)	Ownership	Priority	Connection	Use Run Idle	
	Input	200	24	50	Exclusive	Scheduled	Multicast	False	
	Output	100	24	50	Exclusive	Scheduled	Point to Point	True	
Co	Add Input/Output Assembly Instance Configuration Assembly Instance								
Type Instance # Size (bytes) Optional Data (hexadecimal)									
Config 50 0									
	Add Configuration Assembly Instance							ibly Instance	

Figure #6: Complete Assembly instance configuration

Step 3: Send configuration to the MP2300Siec controller.

Once the assembly instance configurations are finished save the configuration. Next connect to the controller to go online.

Offline	Connect	192 . 168 . 0 . 20
Ommo		

The following dialogue box should appear, as the configuration from the controller was uploaded prior to beginning this process, the only difference will be the Ethernet/IP configuration. Select "Send the offline configuration," and click "OK.".

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Hardware Configuration						
There is no project configuration on the controlle						
O Use the configuration found.						

Now click \square save again (or File \rightarrow Save Project), disconnect from the controller and cycle power for the new settings to take effect.

ΟK

Cancel

Step 4: Variable configuration to the MP2300Siec controller.

Send the offline configuration

Input and output address ranges are automatically allocated for the Adapter device. For this project, logical outputs start at %QB32, the example below shows an output bit at %QB36). The logical inputs for this project begin at %IB6 The starting addresses may vary depending on other devices that are included in the system.

j 🖃 <motoman adapte<="" nx100="" th=""><th>er> 'iNX100' Addre</th><th>ss Range: %IB6 - %IB</th><th>29 (* Do Not Modi</th><th>fy Group Name or Status Variable!! *)</th><th></th></motoman>	er> 'iNX100' Addre	ss Range: %IB6 - %IB	29 (* Do Not Modi	fy Group Name or Status Variable!! *)	
NX100_Status	4096	WORD	VAR_GLOBAL	(* Do Not Modify!! *) Motoman NX100 Adapter Status Variable for: iNX100	%NV30
NewVar1	0	INT	VAR_GLOBAL		%NV6
NewVar2	0	INT	VAR_GLOBAL		%NV8
🖂 <motoman adapter="" nx100=""> 'oNX100' Address Range: %QB32 - %QB59 (* Do Not Modify Group Name or Status Variable!! *)</motoman>					
NewVar4	FALSE	BOOL	VAR_GLOBAL		%QX36.0

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Robot Adapter Configuration

The following is the screen capture of the robot configuration using the teach pendant. The user should be familiar with robot programming, and teach pendant operation. For additional details on the PCU-ETHIO Motoman Ethernet/IP module, please reference the Motoman user's manual (154309-CD)

			Ø	
SYSTEM SYSTEM FILE TOOL DISPLAY SETUP Aa	ADAPTER PCU-ETHIO (EtherNet INPUT SIZE OUTPUT SIZE CONFIGURATION SIZE INPUT INSTANCE OUTPUT INSTANCE CONFIGURATION INSTAN	/IP) ENABLE 24 byte 24 byte 0 word 100 200 CE 50		
Main Menu Sh	ort Cut I/F Panel	Maintenance mod	de	

Adding an MP2300Siec as an Adapter to an NX100 as Scanner is addressed in a separate document.