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.
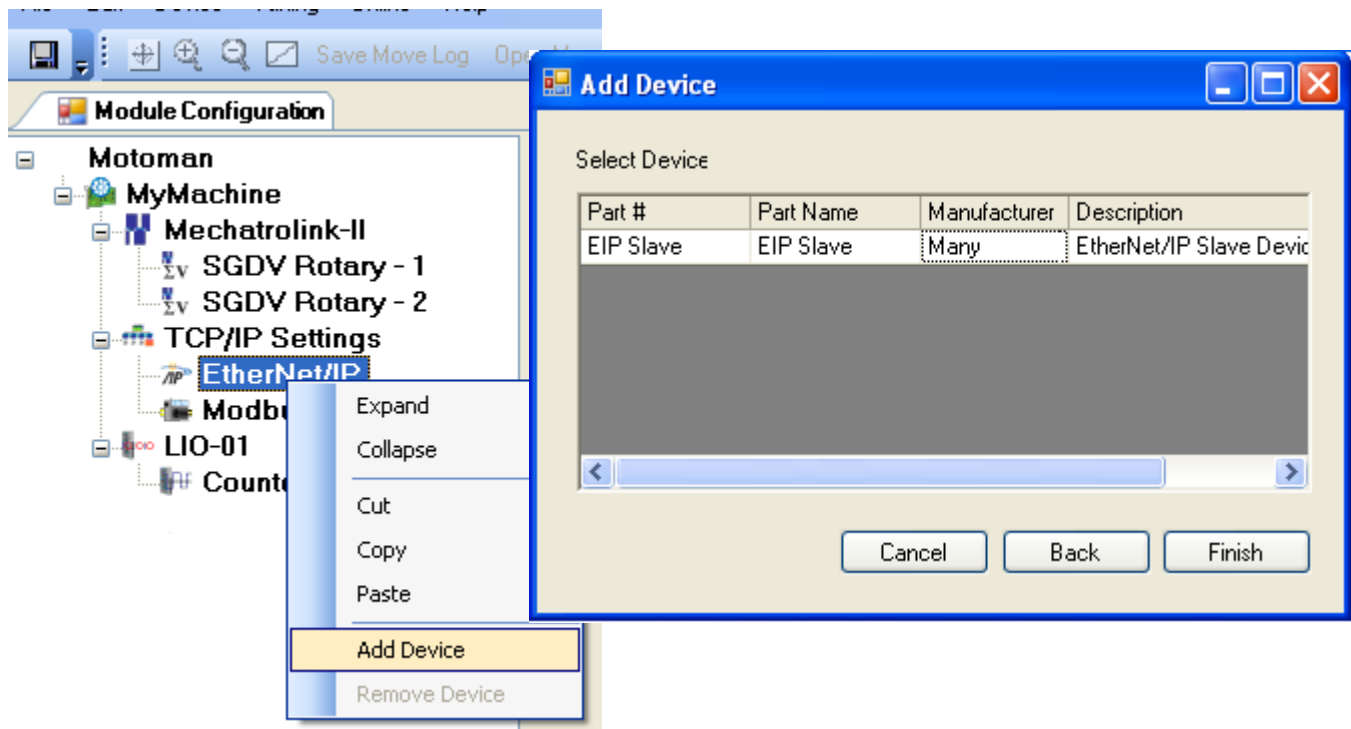
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Implementation Method of Core Operation

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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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
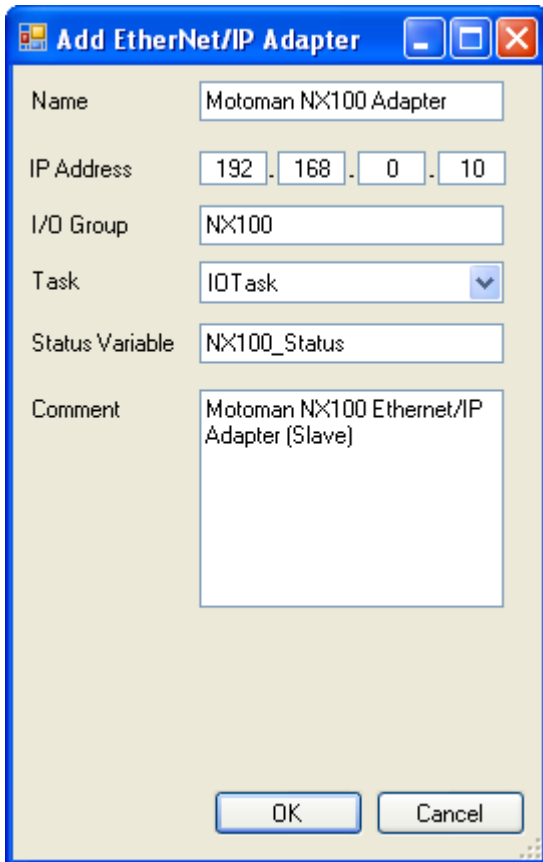- Add a **Comment** about the device if desired.

Figure #2:   Configuration Ethernet/IP Adatper.

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

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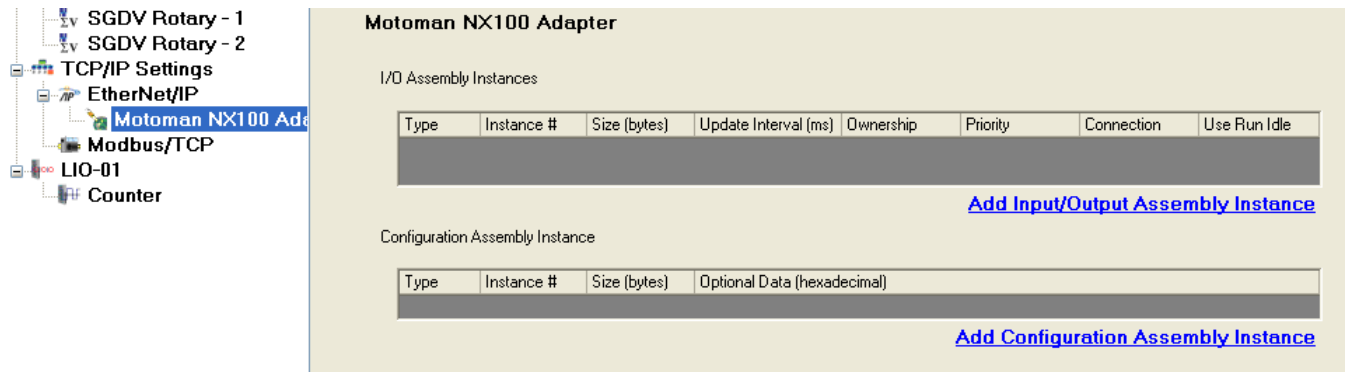Click on the newly created Adapter (slave) device in the Ethernet/IP tree.

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."
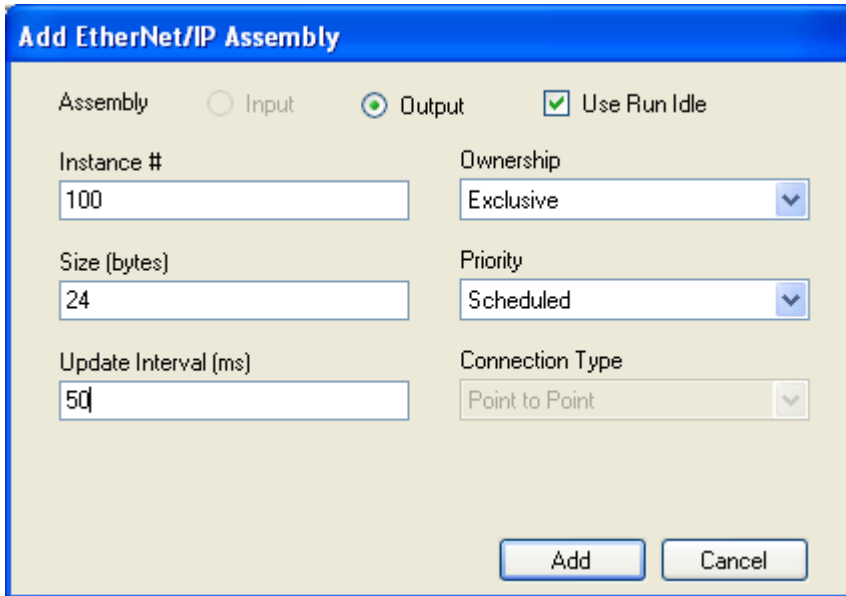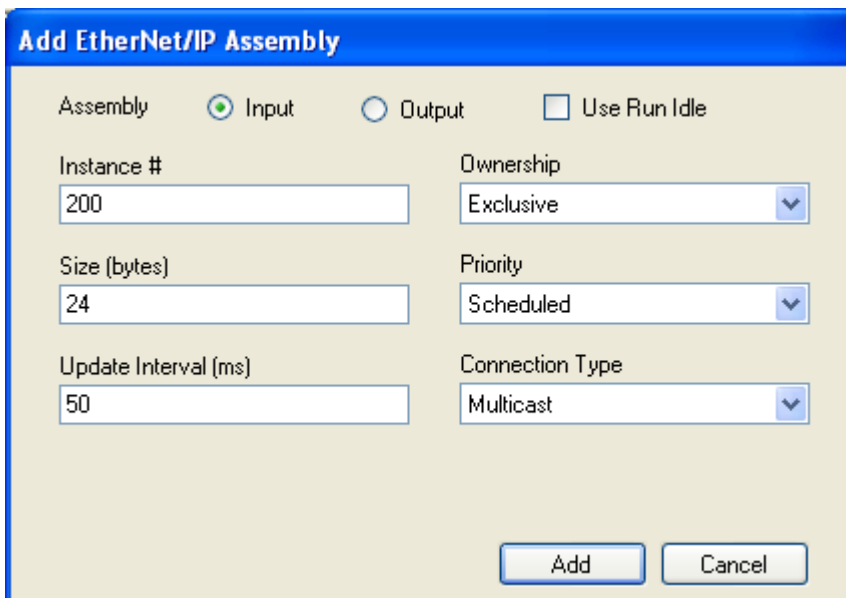

Figure #4:   Input Assembly instance configuration

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

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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Figure #5:   Configuration Assembly instance configuration

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The completed configuration should look like this:

Motoman NX100 Adapter

I/O Assembly Instances

Type	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

Add Input/Output Assembly Instance

Configuration Assembly Instance

Type	Instance #	Size (bytes)	Optional Data (hexadecimal)
Config	50	0	

Add Configuration Assembly Instance

Figure #6:   Complete Assembly instance configuration

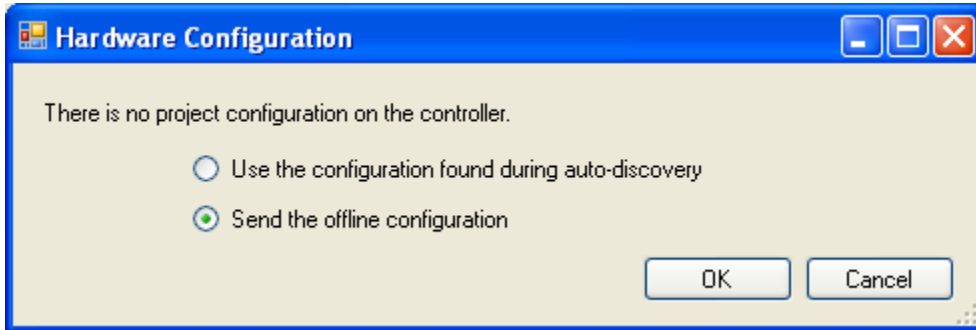**Step 3:   Send configuration to the MP2300Siec controller.**

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

Offline   [Connect]   192 . 168 . 0 . 20

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

**Step 4:   Variable configuration to the MP2300Siec controller.**

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.

⊟ <Motoman NX100 Adapter> 'iNX100' Address Range: %IB6 - %IB29 (* Do Not Modify Group Name or Status Variable!! *)					
NX100_Status	4096	WORD	VAR_GLOBAL	(* Do Not Modify!! *) Motoman NX100 Adapter Status Variable for: iNX100	%MW30
NewVar1	0	INT	VAR_GLOBAL		%MW6
NewVar2	0	INT	VAR_GLOBAL		%MW8
⊟ <Motoman NX100 Adapter> 'oNX100' Address Range: %QB32 - %QB59 (* Do Not Modify Group Name or Status Variable!! *)					
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)
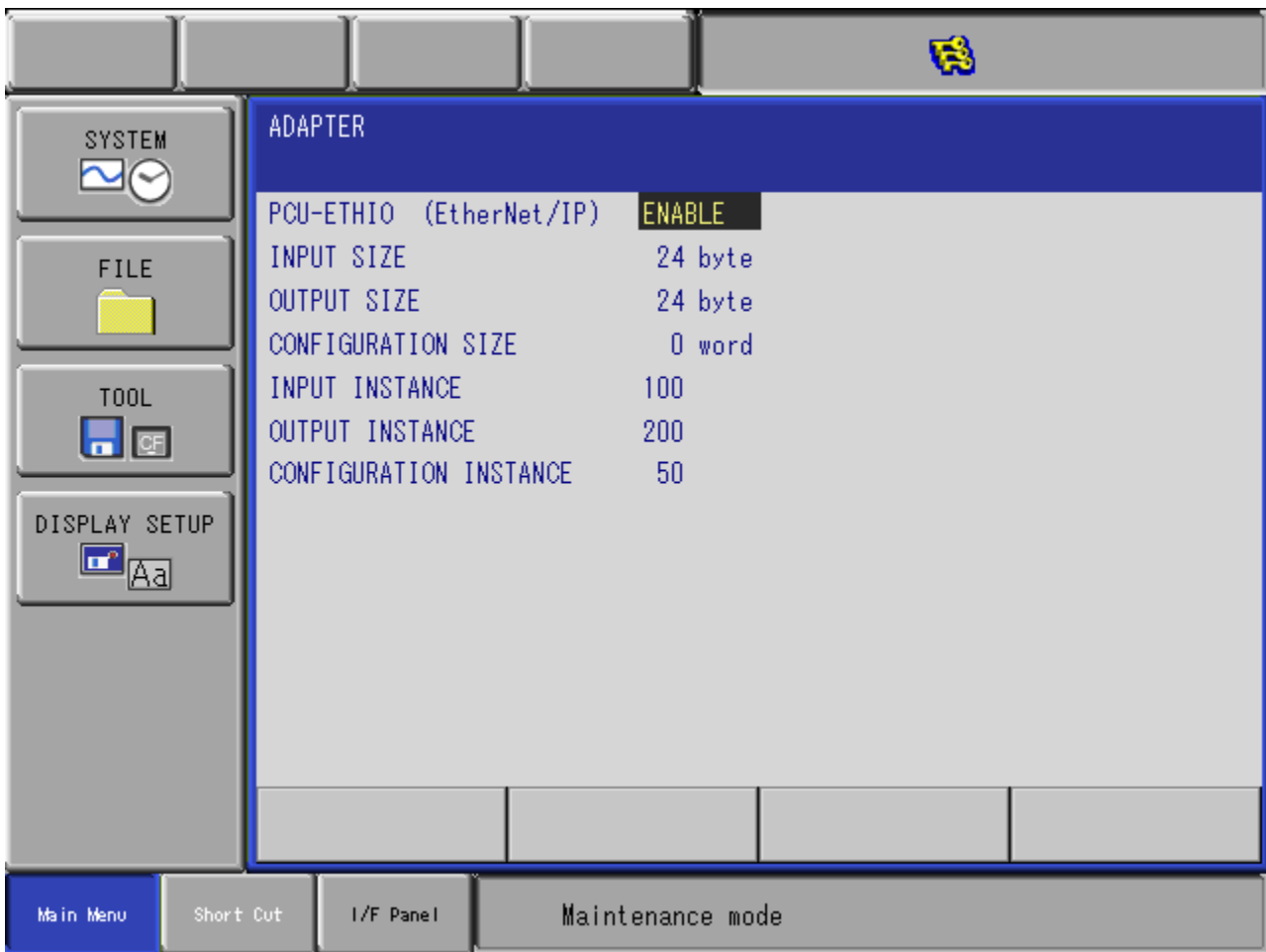
Adding an MP2300Siec as an Adapter to an NX100 as Scanner is addressed in a separate document.