

# NX Safety Standalone Programming Quick Start Guide

# **Table of Contents**

Quick Links	2
Convert NJ/NX Program to NX Standalone	3
First Time Users Quick Start Guide	9
Differences Between NJ/NX and NX Standalone	23
Omron NJ to Rockwell CompactLogic or ControlLogix EtherNet/IP Implicit Messaging	26
EtherNet/IP Error Code Decoder	35



# **Quick Links**

#### Manuals

http://industrial.omron.us/en/products/catalogue/automation\_systems/integrated\_safety/nx\_safety\_distribut ed/default.html

Scroll to the tab section, select "Download", select "Manuals", download pdf file under the EN column.



## Sysmac Studio Software and Registration

http://industrial.omron.us/en/products/software-registration-downloads

### Videos

## Omron Automation & Safety NX - YouTube



www.youtube.com/watch?v=zBcfwyF5vA YouTube Nov 1, 2013 - Uploaded by Omron Automation & Safety Quick Tip Video - NX Safety Entering Global Safety Variables.



# **Convert NJ/NX Program to NX Standalone**

December 2014, Sysmac Studio version 1.11

#### Hardware

Replace the coupler, NX CPU and SIH400 input modules.

#### Open up a new project

1.) This is available with Sysmac Studio version 1.10 and higher. (Released Sept. 2014)

Category: Slave Terminal Device: EtherNet/IP Coupler



#### Hardware set-up without actual hardware

1.) Use schematics or take a snap shot of the original equipment. If you have multiple screens, you can open Sysmac Studios up for both projects.



2.) In this case, the SIH400 safety input module is version 1.0. The Safety stand-alone CPU requires at least a 1.1 version SIH400 module. This will need to be upgraded.

EIF	EIP : NX-EIC202 (Master) ×												
	Unit 0	1	2	3	4	5	6	7	8	9	10		
	NX- EIC202 Master	NX- SL3300 N1	NX- SID800 N2	NX- SID800 N3	NX- SIH400 N4	NX- SOD400 N5	NX- SOD400 N6	NX- PC0010 N7	NX- PC0020 N8	NX- ID5442 N9	NX- OD5256 N10	NX- END01	•
					0								i

(To change: right click on module -> change model -> select the new model -> ok)

Unit 0	1	2	3	4	5	6	7	8	9	10		
NX- EIC202	NX- SL3300	NX- SID800	NX- SID800	NX- SIH400	NX- SOD400	NX- SOD400	NX- PC0010	NX- PC0020	NX- ID5442	NX- OD5256	NX- END01	٣
Master	NI	N2	N3	N4	N5	N6	N7	N8				i

#### **Node Configuration**

3.) From the CPU drop down list, select "new\_SafetyCPU0"





- 4.) Multiview Explorer -> Configurations and Setup -> Communications -> Safety -> Safety I/O -> EIP/Unit2: (Module type) (Instance) -> Parameter -> click on the white X in the upper right corner to view all nodes.
- 5.) Copy and paste the comments from the NJ/NX program into the NX standalone program. You need to do one at a time, and you can use the cut and paste function on your PC. (Note: Copy and pasting the comments is an option.)

Semiconductor Output for Dual Channel Equivalent		FIR (Unit2 · NX-SID800 (N2 · Instance0)
Source On->Off Off->On	L	
0ms V 0ms V	EX	Si00 F35/1 Si01 F35/2
Discrepancy: 500ms 💌		
Test Pulse: Not Used	]	
Mechanical Contact For Single Channel		
Source On->Off Off->On	1	
TO V Oms V Oms V Discrepancy: Oms V	FXC	Si02 G5_SERVO_EDM
Test Pulse: Test Output (mechanical contact)	]	

6.) From the toolbox, drag and drop the device type

### **Global Variables**

- 7.) Copy and paste the global variables.
- 8.) Mutiview Explorer -> Programming -> Data -> Global Variables
- 9.) In NJ/NX Program -> Right click -> select all right click -> copy
- 10.) In the NX Stand Alone project -> Global Variable -> right click -> paste

Global Variables ×				
Name	Data Type	Initial Value	Constant	Comment
UNITS_RDY	BOOL	FALSE		
E_STOP_1_2	SAFEBOOL	FALSE		A22EL 2NC co
G7SA1_EDM	SAFEBOOL	FALSE		P7SA Socket T
G7SA2_EDM	SAFEBOOL	FALSE		P7SA Socket T
G7SA_OUT_1_2	SAFEBOOL	FALSE		P7SA Terminal

11.) (Optional) If you have the original list with the variable names and if they are inputs or outputs, skip these optional steps.

Easy way to enter the standard variables (BOOL) into the exposed variable list.) Copy and Paste the global variable list into Excel.

- 12.) (Optional) In Excel, click on upper left box to select the entire table -> "Data" in the top menu -> Sort -> column B. (The BOOL variables are at the top of the list.)
- 13.) (Optional) -> add a column to the Excel spreadsheet.
- 14.) (Optional) Open up programs in Sysmac Studio to determine if they are inputs or outputs.
- 15.) Hint: If you can't find them easily, Cntr + F, and enter the variable name in the "search what" field, select the "search and replace results" tab at the bottom of the screen, then double click on one of the search results.

### **Expose Variables on Safety Side**

- 16.) Multiview Explorer -> Configurations and Setup -> Communications -> Standard -> Slave I/O -> Exposed Variable
- Right click on "Name" field -> create new -> start typing name (pull down list will appear so you can select the full name)
- 18.) Change the "In / Out" as needed.
- 19.) Repeat the steps for all of the standard variable names.

📶 Exposed Variables 🗙		
Name	In / Out	Data Type
UNITS_RDY	Input	BOOL
RESET_BUTTON	Input	BOOL
REQ_TO_ENTER_BUTTON	Input	BOOL
REQ_TO_ENTER_IND	Output	BOOL
RESET_IND	Output	BOOL
RUN_IND	Output	BOOL
STOP_IND	Input	BOOL
START_UP_IND	Output	BOOL
START_BUTTON	Input	BOOL
STOP_BUTTON	Input	BOOL
ESTOP_IND	Output	BOOL
ERROR STATE	Input	BOOL



#### Assign Variables Location on Standard Side

- 20.) Multiview Explorer -> Configurations and Setup -> Communications -> Standard -> Standard I/O
- 21.) Manually assign the device and linked port. (Hint: If you have multiple screens with a copy of the original and new programs open, look at the I/O map of the original program. NJ controller -> Configurations and Setup -> I/O Map)

🔄 Standard I/O 🗙 🐻 Exposed Variables										
Exposed Variable	In / Out	Data Type	Co	Device	Linked Port					
RESET_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 01					
RUN_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 00					
START_UP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 02					
ESTOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 05					
REQ_TO_ENTER_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 03					
UNITS_RDY	Input	BOOL		Not assigned	Not assigned					
RESET_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 02					
REQ_TO_ENTER_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 03					
STOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 04					
START_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 00					
STOP_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 01					
ERROR_STATE	Input	BOOL		Not assigned	Not assigned					

#### I/O Map

22.) Multiview explorer -> Configurations and Setup -> I/O Map

Notice: Depending on the versions of NX CPUs you were using, the comments from the original NJ/NX program may be ones that were manually created. The NX Standalone program will reuse the comments created in the nodes in the I/O map.

#### NJ/NX

VX-SID800					
▼ Safety Inputs					
Si00 Logical Value	R	SAFEBOOL	F3SJ_1_2	F39-JC3A Receiver Cable Green and White Wire	Global Variables
Si01 Logical Value	R	SAFEBOOL		F3SJ2	
Si02 Logical Value	R	SAFEBOOL	G5_SERVO_EDM	G5 Servo Cable Green and Blue (T0)	Global Variables
Si03 Logical Value	R	SAFEBOOL			
Si04 Logical Value	R	SAFEBOOL	E_STOP_1_2	A22EL 2NC contacts	Global Variables
Si05 Logical Value	R	SAFEBOOL		ESTOP2	
Si06 Logical Value	R	SAFEBOOL	G7SA1_EDM	P7SA Socket Terminals 11 and 12	Global Variables
Si07 Logical Value	R	SAFEBOOL	G7SA2_EDM	P7SA Socket Terminals 11 and 12	Global Variables
▼ Status					
Safety Connection Status	R	SAFEBOOL	UNIT2_STATUS		Global Variables
Safety Input Terminal Status	R	SAFEBOOL			

#### NX Standalone

VX-SID800			
▼ Safety Inputs			
Si00 Logical Value	R	SAFEBOOL	F3SJ1
Si01 Logical Value	R	SAFEBOOL	F3SJ2
Si02 Logical Value	R	SAFEBOOL	G5_SERVO_EDM
Si03 Logical Value	R	SAFEBOOL	
Si04 Logical Value	R	SAFEBOOL	ESTOP1
Si05 Logical Value	R	SAFEBOOL	ESTOP2
Si06 Logical Value	R	SAFEBOOL	G7SA1_EDM
Si07 Logical Value	R	SAFEBOOL	G7SA2_EDM
▼ Status			
Safety Connection Status	R	SAFEBOOL	
Safety Input Terminal Status	R	SAFEBOOL	

23.) Most efficient way to enter the variable names is to use the pull down list. Cut and Pasting the entire list did not transfer all of them correctly.

VX-SID800				
▼ Safety Inputs				
Si00 Logical Value	R	SAFEBOOL	A22S_LEFT	A22RS Left NO contact
Si01 Logical Value	R	SAFEBOOL	A22S_RIGHT	A22RS Right NO contact
Si02 Logical Value	R	SAFEBOOL	A22TK_NC1_NO1	A22TK NC and NO contact
Si03 Logical Value	R	SAFEBOOL		A22TK NC
Si04 Logical Value	R	SAFEBOOL	•	D4SL-N Gate Mon
Si05 Logical Value	R	SAFEBOOL		D4SL-N Gate Mon
Si06 Logical Value	R	SAFEBOOL		D4SL-N Sol Mon
Si07 Logical Value	R	SAFEBOOL		D4SL-N Key Mon



#### NX (Safety) Programs

24.) In the NX Standalone program, create the same program names as the NJ/NX program.



25.) Copy the "Internals from the program" in the NJ/NX program.

📄 Program	mming				
Global Var	iables Program0 ×				
Internals	Name	Data Type	Initial Value	Constant	Comment
Externals	D4SL_N_RDY	SAFEBOOL	FALSE		
	G7SA_EDM_FB	SF_EDM			
	ESTOP_FB	SF_EmergencyStop			
AUTO_MAN_MODE_FB		SF_ModeSelector			
	D4SL_N_FB	SF_GuardLocking			

26.) Paste it into the NX Standalone program. If you have a blank first variable, right click and delete.

📄 Program	Programming										
Global Var	iables Program0 ×										
Internals	Name	Data Type	Initial Value	Constant							
Externals		SAFEBOOL	FALSE								
	D4SL_N_RDY	SAFEBOOL	FALSE								
	G7SA_EDM_FB	SF_EDM									

27.) Repeat steps 14 and 15 for the External variables in the program

📄 Progra	mming				
Global Var	iables	Program0	Unit_Status	×	
Internals		Name		Data Type	Constant
Externals	UNIT3_S	STATUS		SAFEBOOL	
	UNIT4_9	STATUS		SAFEBOOL	
	UNIT5_S	STATUS		SAFEBOOL	
	UNIT6_S	STATUS		SAFEBOOL	
	UNITS_F	RDY		BOOL	

28.) In the NJ/NX program, Select the left column to highlight, then scroll down and hold the shift key on the computer keyboard while selecting the last line. Right click -> copy.



29.) In the NX Standalone program, open up the program, click on the left column to highlight the line, right click and paste. Scroll down to the bottom and delete the last line if it is empty.



30.) Repeat these steps for all of the programs.

### Build

31.) Project -> Build controller

	UNIT2_STATUS AND	t#1000	UNITS_RDY_ON_D SF_TON IN PT	ELAY O ET -
•				
42A9744	4			
Build				
🔀 1 Er	rors 🔥 0 Warnings			
1	Description	Program	I Location I	
🔞 1	[I711] 'UNITS_RDY' is no valid assign	Unit_Status	Network 1 / Operand 'UNI	

#### Download

- 1.) Go Online. 🧖
- 2.) Select "new\_SlaveTerminal\_0" (or the name it was changed to for the coupler )from the device pulldown menu.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 7



- 5.) Right click on "EIC202" -> Coupler Connection (USB) -> Transfer to Coupler
- 6.) Select "new\_SafetyCPU0" (or the name it was changed to for the Safety CPU )from the device pulldown menu.



10.) Controller -> Mode -> Run

Program for current sales demo is "Sales Demo Converted to Stand Alone.smc2".



# **First Time Users Quick Start Guide**

## Open up a new project (Video)



- 1.) Double click on the Sysmac Studio icon.
- 2.) Select "Yes" when the 'Do you want to allow the following program from an unknown publisher to make changes to this computer?"



3.) Select "License", enter the license number, and select "Register License".

The software has a 30-day limited trial period. If you do not yet have your license, skip this step. Once the license is registered, the Sysmac Studio version, installed products, user name, company name, license and license type will be displayed.



(Note: not all information is shown for the license information.)

4.) Select "New Project".





5.) Enter the Project Name. Author and Comment fields are optional.

offline	📔 Project Properties				
New Project	Project name Safety Test Demo				
Copen Project	Author				
fr∰ Import	Comment				

6.) Under "Type", select "Standard Project".



7.) Under "Select Device" section, for category select "Slave Terminal". Verify "EtherNet/IP Coupler" automatically appears for "Device".



8.) Select "Create".



### Workspace Overview



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 10



Each section can be dragged to change its size by moving the mouse over the black solid bar that separates each section, hold down the left mouse button and drag the screen edge.

Safety Test Demo - new_SlaveTerminal_0 - Sysmac Studio	
File Edit View Insert Tools Help	
Multiview Explorer  Rew_SlaveTermind_0  Configurations and Setup  Programming  Output  Output  Output	Toolbox • # <search> • •</search>
El Filter Quitput 🔧 Build	

Tabs are used to switch between multiple screens opened with the same section.

#### Manually Add Hardware (Video)

11.) In the Multiview Explorer section, verify the CPU listed in the pull down box is "new SlaveTerminal 0."



12.) To change rename the CPU, right click on the CPU icon and select "rename" from the list. Note: the list also includes the option to add device and delete.





13.) In the Multiview Explorer, left click on the mouse for "Configuration and Setup". This will allow more options to be viewed and selected.



14.) Left mouse click on the arrow next to EtherNet/IP.



15.) Double click on "NX-EIC202 : Offline



16.) The screen will look similar. Some of the areas may need to be adjusted for better viewing.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 12



### Hardware set-up with actual hardware installed and connected

17.) Right click on the master coupler "NX-EIC202 Master." You the name was change earlier, it may have that name here instead.



18.) Connect the Ethernet cable from the computer to the coupler.

19.) Right click on the master coupler "NX-EIC202 Master", select "Coupler Connection (USB)" at the bottom of the pulldown list, then select "Online"

20.) Right click again on the master coupler "NX-EIC202 Master", the select "Compare and merge with actual configuration."



21.) Select "Apply actual network configuration" and then "Okay." Close the box. Here is an example of a configuration.

Unit 0	1	2	3	4	5	6	7	8	9	10		
NX- EIC202	NX- SL3300	NX- SID800	NX- SID800	NX- SIH400	NX- SOD400	NX- SOD400	NX- PC0010	NX- PC0020	NX- ID5442	NX- OD5256	NX- END01	٣
Master	Nl	N2	N3	N4	N5	N6	N7	N8				
												i

Note: END01 is the end cap. Sysmac Studio automatically added it to the configuration. The actual piece should have come with the coupler.



### Hardware set-up without actual hardware

22.) Under the Group section in the Toolbox, scroll down until you see"Safety CPU Device."

EIP : NX	<-EIC202 (Master)	×	• •				-	Toolbox 🔫 🖡
Unit 0								Group
NX-	NX- 🔻				Item name	Value		Analog Output Device
EIC202	END01				Device name	Master	^	Position Interface Device
					Model name	NX-EIC202		🔁 Cystem Unit Derice
Master					Product name	EtherNet/IP Cou	ıpler	Safety CPU Device
					Unit version	1.0		Cufcty Digital Input Device
					NX Unit Number			📘 Safety Digital Output Devic
	i				NX Unit Mounting S			Input Kasword
					Serial Number			Input Keyword
					Supply Power/Availa	0.00 / 10.00	w	Show all version
					Unit width	46	mm	NX-IA3117 Ver:1.0

23.) Under the "Input Keyword" section, left click on(and hold) the "NX-SL330 Ver1.1" Safety CPU while dragging this next to the master coupler "NX-EIC202 Master." Release the left mouse button when the orange bar appears.



24.) In the "group" section, scroll to the I/O modules being used. Follow the previous step for the I/O modules. Example shows the SID800 input module. (Added orange bar so you can see what it looks like before Sysmac Studio adds the module.)



- 25.) Up to 32 safety input and output modules can be added. Up to 63 total (safety and standard input and output modules can be added. Symbols will appear below the module if incorrect version of modules is selected, power unit is exceeded, and too many modules have been added.
- 26.) Right click on the module for options such as delete, copy, cut, paste, undo, change model, edit unit operation settings, etc.



### Node Configuration (Video)

27.) From the CPU drop down list, select "new\_SafetyCPU0". Notice that the icon for the controller changed.



28.) In Multiview Explorer -> Configurations and Setup -> Communications -> Safety -> Safety I/O -> EIP/Unit2: (Module type) (Instance) -> double click on "Parameter".

Multiview Explorer 🚽 👎	Parameters ×	
_ new SafetyCPU0 ▼	Filter EIP/Unit2 : NX-SID800 (N2 : Instance0)	× <search></search>
Configurations and Setup  Configurations and Setup  The Communications  The Setely  The Safety I/O  The Safet	EIP/Unit2 : NX-SID800 (N2 : Instance0)           Si00           Si01           Si02           Si03           Si04           Si05           Si06           Si07           T0: Not Used           T1: Not Used	<ul> <li>Input Device: Mechanical</li> <li>Input Device: Semiconduc</li> <li>Input Device: Specialty De</li> <li>Output Device</li> </ul>

- 29.) In the toolbox, open up the type of safety device that will be wired into I/O module. The bottom area has a description of the device.
- 30.) If you don't know what device configuration is needed, contact your Omron distributor or Omron Account Manager for a copy of the "NX Safety Selection Setup and Programming Guide".
- 31.) Note: Click on the white X in the upper right corner to view all of the nodes.



- Parameters ×
  Filter EIP/Unit2 : NX-SID800 (N2 : Instance0)
- 32.) Drag and drop the device type from the tool box and attach it to the node. The node stubs will turn green when it can be dropped.

Parameters X	- Toolbox - 🗸 🕂
Filter EIP/Unit2 : NX-SID800 (N2 : Instance0)	<search></search>
	Input Device: Mechanical Contact Type
Mechanical Contact for Dual Channel Equivalent	Mechanical Contact for Dual Channel Compleme
Source On->Off Off->On	Mechanical Contact for Dual Channel Equivalent
10 V Ums V Ums V T1 V Ums V Ums V	Image: Mechanical Contact For Single Channel
Discrepancy: 500ms V	Input Device: Semiconductor Output Type
Test Pulse: Test Output (mechanical contact)	Input Device: Specialty Device
	Output Device



33.) If needed, change the test pulses and discrepancy time.



## 34.) Optional: Enter a comment. Note: This comment will be reused elsewhere in the program.



35.) Complete this for the rest of the devices.

### Global Variables (Video)

36.) Some people create their initial global variable list in Excel.

Note: Variable names have a list of rules, such as no spaces, not starting with a number, etc.)

37.)	) Mutivie	w Explo	rer -> Prog	ramr	ning -> Da	ta -> doub	le click on	"Global	Variables."
	$\mathbb{P}^{\mathbb{S}}_{\mathbb{Z}}$ Parameters $\times$	🖭 Global V	Variables 🗙						+
	Name	I	Data Type	1	Initial Value	Constant	Comment	1	

- 38.) Either double click or right click on "Empty. Click here to add items," then select "create new". Type the variable name.
- 39.) If the variable list was created in Excel, create a dummy global variable. Right click on the dummy variable and select "copy".

Parameters	🔤 Global Variables 🗙				•
Name	Data Type	Initial Value	Constant	Comment	1
Dummy	SAFEBOOL	FALSE			

40.) In the Excel spreadsheet, paste the dummy variable into a blank row.

Dummy	SAFEBOOL	FALSE	FALSE
Hild_a_brand			
stop			
mouse			

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 16



41.) Copy the three new fields the dummy variable added and paste into the other global variables.

Dummy	SAFEBOOL	FALSE	FALSE
Hild_a_brand	SAFEBOOL	FALSE	FALSE
stop	SAFEBOOL	FALSE	FALSE
mouse	SAFEBOOL	FALSE	FALSE

42.) Copy the rest of the global variables.

Dummy	SAFEBOOL	FALSE	FALSE
Hild_a_brand	SAFEBOOL	FALSE	FALSE
stop	SAFEBOOL	FALSE	FALSE
mouse	SAFEBOOL	FALSE	FALSE

43.) In Sysmac Studio under "name, right click and select "paste".

Parameters	🔤 Global Variables 🗙				-
Name	Data Typ	e   Initial Value	Constant	Comment	I I
Dummy	SAFEBOOL	FALSE			
Hild_a_brand	SAFEBOOL	FALSE			
stop	SAFEBOOL	FALSE			
mouse	SAFEBOOL	FALSE			

44.) Delete the Dummy variable.

S Parameters	🖉 Global Variables 🗙				
Name	Data Type	Initial Value	Constant	Comment	1
Hild_a_brand	SAFEBOOL	FALSE			
stop	SAFEBOOL	FALSE			
mouse	SAFEBOOL	FALSE			

- 45.) (Optional) If you have the original list with the variable names and if they are inputs or outputs, skip these optional steps.
- 46.) Note: Safety variable have a data type of "SAFEBOOL". Non safety variable have a data type such as "BOOL".



### Expose Variables on the Safety Side (Video)

- 47.) Multiview Explorer -> Configurations and Setup -> Communications -> Standard -> Slave I/O -> Exposed Variable
- Right click on "Name" field -> create new -> start typing name (pull down list will appear so you can select the full name)
- 49.) Change the "In / Out" as needed.
- 50.) Repeat the steps for all of the standard variable names.

#### Assign Variables Location on Standard Side

- 51.) Multiview Explorer -> Configurations and Setup -> Communications -> Standard -> Standard I/O
- 52.) Manually assign the device and linked port. (Hint: If you have multiple screens with a copy of the original and new programs open, look at the I/O map of the original program. NJ controller -> Configurations and Setup -> I/O Map)

🚋 Exposed Variables 🗙		
Name	In / Out	Data Type
UNITS_RDY	Input	BOOL
RESET_BUTTON	Input	BOOL
REQ_TO_ENTER_BUTTON	Input	BOOL
REQ_TO_ENTER_IND	Output	BOOL
RESET_IND	Output	BOOL
RUN_IND	Output	BOOL
STOP_IND	Input	BOOL
START_UP_IND	Output	BOOL
START_BUTTON	Input	BOOL
STOP_BUTTON	Input	BOOL
ESTOP_IND	Output	BOOL
ERROR_STATE	Input	BOOL

🔄 Standard I/O 🗙 🦾 Exposed Variables					
Exposed Variable	In / Out	Data Type	Cc	Device	Linked Port
RESET_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 01
RUN_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 00
START_UP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 02
ESTOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 05
REQ_TO_ENTER_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 03
UNITS_RDY	Input	BOOL		Not assigned	Not assigned
RESET_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 02
REQ_TO_ENTER_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 03
STOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 04
START_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 00
STOP_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 01
ERROR_STATE	Input	BOOL		Not assigned	Not assigned

#### I/O Map (Video)

53.) Multiview explorer -> Configurations and Setup -> I/O Map

Note: The NX Stand Alone program will reuse the comments created in the nodes in the I/O map.

VX-SID800			
▼ Safety Inputs			
Si00 Logical Value	R	SAFEBOOL	F3SJ1
Si01 Logical Value	R	SAFEBOOL	F3SJ2
Si02 Logical Value	R	SAFEBOOL	G5_SERVO_EDM
Si03 Logical Value	R	SAFEBOOL	
Si04 Logical Value	R	SAFEBOOL	ESTOP1
Si05 Logical Value	R	SAFEBOOL	ESTOP2
Si06 Logical Value	R	SAFEBOOL	G7SA1_EDM
Si07 Logical Value	R	SAFEBOOL	G7SA2_EDM
▼ Status			
Safety Connection Status	R	SAFEBOOL	
Safety Input Terminal Status	R	SAFEBOOL	

54.) Most efficient way to enter the variable names is to use the pull down list, start typing, and select the variable name. It will only list variable already listed in the global variable list.

	IX-2ID800				
🔻 S	afety Inputs				
	Si00 Logical Value	R	SAFEBOOL	A22S_LEFT	A22RS Left NO contact
	Si01 Logical Value	R	SAFEBOOL	A22S_RIGHT	A22RS Right NO contact
	Si02 Logical Value	R	SAFEBOOL	A22TK_NC1_NO1	A22TK NC and NO contact
	Si03 Logical Value	R	SAFEBOOL		A22TK NC
	Si04 Logical Value	R	SAFEBOO	•	DISL-N Gate Mon
	Si05 Logical Value	R	SAFEBOOL		D4SL-N Gate Mon
	Si06 Logical Value	R	SAFEBOOL		D4SL-N Sol Mon
	Si07 Logical Value	R	SAFEBOOL		D4SL-N Key Mon

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 18



55.) Option for machine where I/O modules could be shut down for maintenance with zones, but still allow the machine in other zones to run. It is recommended to set this up. Enter a variable name for each of the "Safety Connection Status."

🔻 👰 NX Bus			ĺ	
Master				
NX-SID800				
▼ Safety Inputs				
Si00 Logical Value	R	SAFEBOOL	Hild_a_brand	Unit2_Input0_Emergency Stop
Si01 Logical Value	R	SAFEBOOL		
Si02 Logical Value	R	SAFEBOOL	mouse	
Si03 Logical Value	R	SAFEBOOL		
Si04 Logical Value	R	SAFEBOOL	stop	
Si05 Logical Value	R	SAFEBOOL		
Si06 Logical Value	R	SAFEBOOL		
Si07 Logical Value	R	SAFEBOOL		
▼ Status				
Safety Connection Status	R	SAFEBOOL	SID800_Unit2_OK	
Safety Input Terminal Status	R	SAFEBOOL		

## NX (Safety) Program

Video - Insert New Line (network)

Video - Create a basic program

56.) Multiview Explorer -> Programming -> POUs -> Programs -> Program0. Note: To change the name of program0, right click and select "rename". Type in the new name and press "enter".



57.) Double click on the program name.

Multiview Explorer 👻 🤻	S Parame	ters 🛛 💵 Global Variable	es 🛛 🖨 I/O Map	¦ang Program0 ×			- -	Toolbox	• 9
□ new Safety/CPU0 ▼	Internals	Name	I Data Type	Initial Value	Constant	Comment		<search></search>	▼ P ×
	Externals							Boolean Operators	-
<ul> <li>Configurations and Setup</li> </ul>								▶ General	
▼ Programming								Note Constant	
V POUs								Math Operators	
								Other Operators	
L 🕃 Function Blocks	1							Safety Function blocks	
Data								Safety Standard FBs	
↓ Iss Program0									

58.) In the toolbar (on the right side), open up the "Boolean Operator" section by clicking on the arrow.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 19



59.) If you only have 2 safety I/O modules, drag and drop AND(2) to the center of the screen until a green box that says "Start Here" appears. Drop it on the green box. If you have more than 2 I/O modules, select AND(3).

	moduloo, oo	10007	10(0).						
Param	eters 🛛 🗤 Global Variables	🖨 I/O Map	먉 Program0 ×			-	Toolbo	x	
Internals	Name I	Data Type	Initial Value	Constant	Comment	1	<searc< td=""><td>h&gt;</td><td>•</td></searc<>	h>	•
Externals	Empty. Click here to add Item.						▼ Boo	lean Operators	
							— F—	AND (3 Inputs)	
							- <b>F</b> -	NOT	
							— F—	OR (2 Inputs)	
1							— <b>F</b> —	OR (3 Inputs)	
		-					— F—	XOR	
	AND	K					► Ger	neral	_
							🕨 Ma	th Operators	
							► Oth	er Operators	

60.) The AND function block can have up to 8 inputs. To add more inputs, right click on the function block and select "Add Input".



61.) Just left of the dash mark on the input side (left), left click. Start to type the name of the variable. A list of the variable will appear that you can choose from. Add all of the "Safety Connection Status" variables added in the I/O map earlier.

▼ Status			
Safety Connection Status	R	SAFEBOOL	SID800_Unit2_OK
Safety Input Terminal Status	R	SAFEBOOL	



Note: Example on the right is from another program.

62.) To the far left of the row, right click and select "Insert Network Below" to add another row.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 20



- 63.) In the toolbar (on the right side), open up the "Safety Function blocks" section by clicking on the arrow. This is a list of the function blocks needed for the safety devices.
- 64.) Left click on a function block and drag it to the left so it over the "Start here" green box.

		boolean operators
	SID800_Unit2_OK	▶ General
		Math Operators
		<ul> <li>Other Operators</li> </ul>
		<ul> <li>Safety Function blocks</li> </ul>
2		FB SF_Antivalent
		FB SF_EDM
	SF EmergencyStop	FB SF_EmergencyStop
	-Activate Ready-	FB SF_EnableSwitch
	S EStopIn S EStopOut	FB SF_Equivalent
		FB SF_ESPE
	S StartReset	FB SF_GuardLocking
		FB SF_GuardMonitoring
	Dasat	F8 SF_ModeSelector
		Concerned SE MutingDar

65.) Enter a name for the safety function block. (Left click and type when ??? turn into blanks and the ... button, then enter.)



66.) The activate inputs verifies the module is active. If multiple I/O modules were used, this would use the same variable defines as the output of the AND function block.



In this example "SID800\_Unit2\_OK" could be used. If the Safety Connection status variable was not defined in the I/O map, "true" would be used.



- 67.) Enter the inputs variables on the left side of the function block, and the output variable on the right side. In this example, more logic will be added to the output variable. If the logic string was long or needed in multiple places, a variable could be defined. See the manual or quick start guides for more programming details.
- 68.) To add another function block, drag it until the green diamond appears on the S\_EStopOut output.

inst_001				
SF_GuardMonitoring			AND	
-Activate	Ready	E_STOP_Val	1 1	
S_GuardSwitch1 S_GuardMon	itoring			

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 21



#### Build (Video)

- 69.) Project -> Build controller (or F8).
- 70.) Click on the "Build" tab to see the errors and warnings.

Multivi 4	De programut, programit,								
1	Internals Name	I Data Type	1 Initial Value	Constant   Co					
- Configura	inst 000	SE EmergenciSton	THESE	0					
- Department	inst 001	SF GuardMonitori	-						
	inst_002	SF_EDM	-						
	inst_003	SF_GuardMonitori							
	inst_004	SF_EDM							
	E_STOP_Val	SAFEBOOL	FALSE		_				
> ==		9 <sup>4</sup>		- 20	5.41	2710E1			
1 P 85					2044	2/1001			
	the second second		AND		Bui	ld			
	N3_Safety_Conn	ection_Status	R.		8	0 Erro	ors 🚹 18 Warnings		
	N4_Safety_Conn	ection_Status					Description	Program	Location
	< _ m _				4	1	[A048] Unused GVL in application	GVL	
	Build				- <u>A</u>	2	[I133] Useless variable: 'N2_Si02_Log	Instance0	
	Several Alexandria	I Pmoran		ration I	- 🔺	3	[1133] Useless variable: 'N2_Si03_Log	Instance0	
	1 [A048] Unused GVL in a     2 [I133] Useless variable:	pplication GVL N2_SI02_Loj Instance0			- 🔺	4	[133] Useless variable: 'N2_Safety_I	Instance0	
	A 3 (1135) Useless var ible:	N2_Si03_Loi Instance0 N2_Safety_li Instance0			드라	Outpu	it 📈 Build		

# Download (Video Coupler) (Video Safety)

- 71.) Go Online. 🐣
- 72.) Select "new\_SlaveTerminal\_0" (or the name it was changed to for the coupler) from the device pulldown menu.

ne	w_Sl	aveTe	rmina	_0		ľ	•				
73.)		Cor	nfigu	ratior	s and S	Setup	-> Et	therN	et/IP ·	-> N>	K-EIC202
Mul	ltiview	v Explo	rer	_							
n	ew_SI	laveTer	minal_(	)		•					
•	Cont	figurat	ions a	nd Setu	р						
		V E	therNe	t/IP							
			NX-E	IC202 : (	Offline						
74.)		Dou	ıble	click	on NX-l	EIC20	)2				
E E	IP : NX-	EIC202 (N	/laster) 🗙								
L	Jnit 0	1	2	3							
E	NX- 1C202	NX- SIH400	NX- SL3300	NX- SID800							
N	/laster	Nl	N2	N3							
							_			_	

75.) Right click on "EIC202" -> Coupler Connection (USB) -> Transfer to Coupler
76.) Select "new\_SafetyCPU0" (or the name it was changed to for the Safety CPU )from the

#### device pulldown menu.

	∟ new_SafetyCPU0 ▼	
77.)	) Controller -> Mode -> Program	
78.)	Controller -> Mode -> Debug	

- 79.) Controller -> Safety Validation
- 80.) Controller -> Mode -> Run

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 22



# **Differences Between NJ/NX and NX Standalone**

### **Creating a New Project**

When creating a new project, under "Select Device" section, for category select "Slave Terminal". Verify "EtherNet/IP Coupler" automatically appears for "Device".

Category Slave Terminal	Offline  New Project  Open Project  Import	Project Properties Project Properties Voto Comment Type Standard Regist	Select Dev	ice	
Device EtherNet/IP Coupler	Connect to Device	Solect Device           Collegery           Device           Wension           Wension	Category Device	Slave Terminal EtherNet/IP Coupler	

#### Online

Difference #1 No choice with communication type (Ethernet or USB) when going online.

Difference #2 No way to go online from menu bar of the coupler.

(However, really easy to log on from the menu bar of the Safety CPU.)

Only able to go online with the USB cable.



### **CPU Pulldown List**

The CPU listed in the pull down box is "new\_SlaveTerminal\_0."



### Hardware Configuration

(No NX-SL3500)

New naming is EtherNet/IP and it automatically has the coupler.



The toolbox does not list couplers.

It only shows the NX-SL3300 V1.1.



It will automatically select the SIH400 V1.1 module.

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 23



#### Assign Variables Location on Standard Side

- 1.) Multiview Explorer -> Configurations and Setup -> Communications -> Standard -> Standard I/O
- Manually assign the device and linked port. (Hint: If you have multiple screens with a copy of the original and new programs open, look at the I/O map of the original program. NJ controller -> Configurations and Setup -> I/O Map)

🔄 Standard I/O 🗙 🐻 Exp	oosed Varia	bles			
Exposed Variable	In / Out	Data Type	Cc	Device	Linked Port
RESET_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 01
RUN_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 00
START_UP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 02
ESTOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 05
REQ_TO_ENTER_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 03
UNITS_RDY	Input	BOOL		Not assigned	Not assigned
RESET_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 02
REQ_TO_ENTER_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 03
STOP_IND	Output	BOOL		Unit10:NX-OD5256(N10)	Output Bit 04
START_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 00
STOP_BUTTON	Input	BOOL		Unit9:NX-ID5442(N9)	Input Bit 01
ERROR_STATE	Input	BOOL		Not assigned	Not assigned

#### Standard I/O Map

It is located under the safety CPU.



#### **Insert Additional Coupler**

Menu bar -> Insert -> Slave Terminal -> Ethernet/IP coupler



Additional couplers can be added, but they will not have everything needed to map I/O, label variable or do programming unless an NX CPU is added.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 24



#### Can I expand I/O on the network with additional couplers?

No. (Page 41 NX-series Safety Control Unit User's Manual Z930) Coupler unit is limited to the EtherNET/IP Slave Terminal at the connection.



Sysmac Studio Setting, programming, and debugging the Safety Control Units

#### You can add Safety CPU to each coupler with safety. (page 45)



### Safety I/O

Node is listed as EIP instead of a node setting

4	Configurations and S	etup					[] (	
Safety I/O ×								
IT.	Node #/Unit #	Active	Device	Product Information	FSoE slave address	FSoE watchdog timer (WDT)	WDT auto setting	
Г	EIP/Unit2	<b>I</b>	N2	NX-SID800; 1.0	1	45		
	EIP/Unit3	<b>I</b>	N3	NX-SIH400; 1.1	2	48		
	EIP/Unit4		N4	NX-SOD400; 1.0	3	45	<ul><li>✓</li></ul>	
	EIP/Unit5		N5	NX-SOH200; 1.0	4	45		

NX Stand Alone Quick Start Guide - Version 3.2 Feb. 27, 2015



# **Omron NJ to Rockwell CompactLogic or ControlLogix EtherNet/IP Implicit Messaging**

#### Overview

This section is to setup an EtherNet/IP Tag Datalink (Implicit Messaging) connection between an Omron NJ or NX Standalone Machine Automation Controller (MAC) and a Rockwell ControlLogix or CompactLogix controller. This Tag Datalink will share an array of 100 Integer values (200 Bytes) from the Omron NJ MAC to a Rockwell CompactLogix and an array of 100 Integer values (200 Bytes) from the CompactLogix to the NJ MAC. A ControlLogix would be similar to the steps shown in this document.

There is a second tag used in the NJ, which maps the 32 bit Run / Idle header in the connection from the CompactLogix to the NJ, which is necessary, but does not contain meaningful data. This is the tag called CLtoNJRunIdleHeader.



### Example Configuration





# **NJ Configuration**

1. In Sysmac Studio, configure the Sysmac NJ tags as shown in the Global Variables.

_	Global Variables	× +					
Ir	Name	Data Type	Initial Value	AT	Retain	Constant	Network Publish
	NJtoCL	ARRAY[099] of INT					Output
	CLtoNJ	ARRAY[099] of INT					Input
	CLtoNJRunIdleHeader	ARRAY[01] of INT					Input

2. Synchronize the project with the NJ controller to transfer the Tags to the NJ.

Tools Help	_				
Troubleshooting					
Backup •	63 🕺 🍢 🛍 🛈				
Export Global Variables	Network Configurator				
Comments for Variables and Data Types 🕨	CX-Designer				
Import ST Program	+				
Option	Turne I Initial Value				

- 3. In Sysmac Studio, export the Tags to the Network Configurator for EtherNet/IP.
- 4. Save the .csv file that contains the tags. This will be imported in a later step.



 In the Network Configurator for EtherNet/IP, add an NJ to the network diagram. Select the correct model and Revision. Rev 1 = NJ firmware 1.00, 1.01, or 1.02. Rev 2 = NJ firmware 1.03 or higher.





6. Right click on the NJ in the network diagram, and select '**Change Node Address**'. Enter the IP Address of the NJ, and click '**OK**'.

EtherNet/IP_1	
Parameter +	
192.168.2 NJ501-1 📽 Monitor	
Reset	
Maintenance Information	
Register to other Device	Change IP Address
External Data 🕨	
, K Cut	New IP Address : 192 . 168 . 1 . 44
Usage of D	
Change Device Comment	

- 7. Double click on the NJ CPU in the network diagram.
- 8. Click on the 'Tag Sets' tab, and click 'To / From File', and select 'Import from File'.

Edit Device Parameters : 192.168.1.44 NJ501-1300			×
Connections Tag Sets			
In - Consume Out - Produce			[]
Name	Fault	Size Bit	ID
New		E <u>x</u> pand All	Collapse All
Edit <u>I</u> ags Delete all of <u>u</u> nused Tag Sets Us	age Count : 0/32	Import To	/From File
		Exc	ort to File
			ort from File

9. Browse for the .csv file created earlier, select it, and click '**Open'.** 

Import Tag/1	lag Set	<u>?</u> ×
Look in: 🔞	Desktop 💽 📀 🏂 📂	
My Docum	ents	
🛛 🛃 My Compu	ter	
My Networ	rk Places	
ExportTag	js.csv	
Els a service	<b>F</b>	
rile <u>n</u> ame:	Export   ags.csv	Upen
Files of type:	CSV Format File (*.csv)	Cancel
	,	/

10. When "All of the network variables will be imported" dialog box appears, click 'Yes'.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 28



×

Auto

<u>C</u>ollapse All

To/From <u>F</u>ile

Cancel

- 11. When "New Tag sets will be created automatically from the Tags that will be imported" click '**Yes'.**
- On the 'In- Consume' tab, select the Tag Set named 'CLtoNJRunIdleHeader', and click 'Delete'.



Network Configurator

CLtoNJRunIdleHeader

New.

Edit <u>T</u>ags.

<u>E</u>dit.

<u>D</u>elete

Delete all of unused Tag Sets Usage Count : 3/32

- When the "Selected Tags set and Tags that the Tag sets have all been deleted" dialog box appears, click 'No'.
- 14. On the '**In- Consume**' tab, select the Tag Set named '**CLtoNJ**', and click '**Edit**'.



4Byte

Expand All

OK

Edit Device Parameters : 192.168.1.44 NJ501-1300					×
Connections Tag Sets					
In - Consume Out - Produce					_
Name	Fault	Size	Bit	ID	-
		200Byte		Auto	-
New Edit Delete		E;	gpand All	<u>C</u> ollapse All	
Edit <u>T</u> ags Delete all of <u>u</u> nused Tag Sets Usage	e Count : 2	<b>1/32</b>	port	To/From <u>F</u> ile	
			OK	Cance	el

15. Select the Tag named 'CLtoNJRunIdleHeader' on the right, and click the 2 left pointing arrows to add this tag to the Tag Set on the left.



QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015



16. In the Tag Set on the left, select the Tag named 'CLtoNJRunIdleHeader', and click the Up Arrow to move the tag to the top of the list.

Edit Tag Set	
Name : CLtoNJ	Controller Status Not Include      Include
Tag List	CandidateTag List
Name Fault   K CLtoNJ 200 CLtoNJRunidleHeader 4 >>>	Name Faul Size
	×

17. Verify that the CLtoNJRunIDleHeader is now at the top of the list, then click 'Advanced'.



18. Select the '**Manual**' radio button, and enter a value of **100** for the Assembly Number. Click '**OK**'.

19. Click '**OK**' to complete the edit of the Tag Set.





QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015



х

×

20. Click on the '**Out – Produce**' tab, and select '**Edit**'.

21. Click 'Advanced'.

In - Consume Out - Produce				
Name	Fault	Size	Bit	ID
NJtoCL		200Byte		Auto
New Edit Delete		E	<u>x</u> pand All	<u>C</u> ollapse All
Edit <u>T</u> ags Delete all of <u>u</u> nused Tag Sets Usage	Count: 2	2/32	nport	To/From <u>F</u> ile
			OK	Cano
Edit Tag Set		×	(	
Name : NJtoCL Controller Status	clude C	Include		
Tag Litt           Name         Fault         Size         Bit           NinocL         Clear         2008         Image: Clear State	alt S	ize Bit		

OK Cancel

Advanced Setting

Instance ID

dit Device Parameters : 192.168.1.44 NJ501-130(

Connections Tag Sets

Advanced

- 22. Select the '**Manual**' radio button, and enter a value of **110** for the Assembly Number. Click '**OK**'.
- 23. Click '**OK**' to complete the edit of the Tag Set.
- 24. Click 'OK' to complete the network configuration of the NJ.

25. The network configuration has been setup, but still need to be downloaded to the NJ. To connect to the network, click 'Options' / 'Select Interface' menus. Choose 'Ethernet I/F'.

1	Option Help	
۴.	Select Interface	CJ2 USB/Serial Port
Ē	Edit Configuration File	CS/C11 Serial Port -> EIP Unit I/F
ńi		Ethernet I/F
Τ	Setup <u>M</u> onitor Refresh Timer	Ethernet -> CS/CJ1 ETN-EIP Unit I/F
	Install Plugin Module	NJ Series Ethernet Direct I/F
	Install Interface Module	NJ Series USB Port
	Update Parameter <u>a</u> utomatically, when Configuration was changed	
	Update Device Status automatically, when it was connected on Network	1

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

OMRON AUTOMATION & SAFETY • © 2015 Omron Electronics LLC • www.omron247.com

C Auto Manual 110 Range: 100-199 OK Cancel





26. Click on the '**Network' / 'Connect'** menus to connect to the network.

27. Click 'OK' to connect .

💐 Untitled - Network Configurator									
File Edit View	Network	Device	EDS File	Tools	Option	Help			
D 🚅 🔲		ect.			C	trl+W			
	👳 Disco	nnect			C	itrl+Q			
	🕼 Chan	ge Conne	ct <u>N</u> etworl	k					

- Select Connect herizon is journal is at correct.
   St

   Sinder strates and the loc correct.
   Sinder strates and the loc correct.

   Sinder strates and the loc correct.
   Sinder strates and the loc correct.

   Sinder strates and the loc correct.
   Sinder strates and the loc correct.

   Sinder strates and the loc correct.
   Sinder strates and the loc correct.

   Sinder strates and the loc correct.
   Sinder strates and the loc correct.

   Decker Tops
   Peakers:

   Decker Tops
   Restarce.

   Definition
   OK
- 28. Click '**OK'** to select 'Use the existing network'.
- Download the EtherNet/IP settings to the NJ by right clicking on the NJ in the network diagram, and select 'Parameter' / 'Download'.

C EtherN	C EtherNet/IP_1							
	Parameter	▶ 🕂 <u>W</u> izard						
	A Monitor	🗒 Edit						
192.168.1.4 NJ501-1300	<u>R</u> eset	Den						
	Maintenance Information	A Usland						
	Register to other Device	Download						
	External Data	Verify						

•

Cancel

Use the existing net

- 30. When "Downloading parameters to selected devices will start", dialog box appears, click **'Yes'.**
- Downloading parameters to selected devices will start.
   OK?
   Ves
   No

 If the NJ is not in program mode, you will get the option to change modes, or download with the NJ in the current mode. Click 'Download with Current mode'.

ι	List of Device that are executing							
	The following devices are not i	n program mode.						
	#	Product Name	Comment					
	<i>🍫</i> 192.168.1.44	NJ501-1300						
	Download after changed to <u>F</u>	Program model Download wi	ith <u>C</u> urrent mode Cancel					

32. When "Download of device parameters was completed" dialog box appears, the NJ is ready to accept a connection from a CompactLogix. Click 'OK'.





# CompactLogix Configuration

- 1. Open an existing project file or create a new project file for the CompactLogix in RSLogix 5000.
- 2. Configure the IP address of the CompactLogix as 192.168.1.77 using RSLogix 5000 (as an example IP Address).
- 3. In RSLogix 5000, right click on the Ethernet module in the CompactLogix, and click '**New Module**'.



4. In the 'Communications' group, select 'ETHERNET-MODULE Generic Ethernet Module', and click 'OK'.

Module	Description	Vendor
Communications		[
- 1783-ETAP1F	3 Port Ethernet Tap, 1 Fiber/2 Twisted-Pair Media	Allen-Bradley
- 1783-ETAP2F	3 Port Ethernet Tap, 2 Fiber/1 Twisted-Pair Media	Allen-Bradley
- 1788-EN2DN/A	1788 Ethernet to DeviceNet Linking Device	Allen-Bradley
- 1788-ENBT/A	1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley
1788-EWEB/A	1788 10/100 Mbps Ethernet Bridge w/Enhanced Web Serv.	. Allen-Bradley
- 1794-AENT	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media	Allen-Bradley
Drivelogix5730 Eth.	10/100 Mbps Ethernet Port on DriveLogix5730	Allen-Bradley
ETHERNET-BRIDGE	Generic EtherNet/IP CIP Bridge	Allen-Bradley
ETHERNET-MODULE	Generic Ethernet Module	Allen-Bradley
	SuftLugixSouu Ethennet/1P	Allen-bradley
L'UNE NEUTP		
PSSCENA	Ethernet Adapter, Twisted-Pair Media	Parker Hannif
	Ethernet Adapter, Twisted-Pair Media 26 Port Managed Switch	Parker Hannif Allen-Bradley
	Ethernet Adapter, Twisted-Pair Media 26 Port Managed Switch	Parker Hannif Allen-Bradley
	Ethernet Adapter, Twisted-Pair Media 26 Port Managed Switch <u>F</u> ind	Parker Hannif Allen-Bradley Add Favorite



5. Configure the connection as shown, and click **OK.** 

New Module						×
Type: ETHERN Vendor: Allen-Bra Parent: LocalENI Name: OmronN Description:	IET-MODULE Generic Etherne dley J	t Module Connection Pa	rameters Assembly Instance: 110	Size:	(16-bit)	
		O <u>u</u> tput:	100	100 🗄	(16-bit)	
Comm <u>F</u> ormat Data - IN	1T 💽	Configuration	3	0	(8-bit)	
Address / Host Name  IP <u>A</u> ddress:  19	92 . 168 . 1 . 44	<u>S</u> tatus Input:	-		J	
C <u>H</u> ost Name:		Status Outpu	t			
🔽 Open Module Propert	ies	OK	Cano		Help	

6. Configure the RPI for 10 ms, and click **OK**.



Tags will have been created automatically for the OmronNJ connection as shown below.

⊡-OmronNJ:I	{}	{}		AB:ETHERNET
⊡-OmronNJ:I.Data	{}	{}	Decimal	INT[100]
⊡-OmronNJ:0	{}	{}		AB:ETHERNET
	{}	{}	Decimal	INT[100]

- 7. Download the project to the CompactLogix processor using RSLogix 5000.
- 8. Using RSLogix 5000 and Sysmac Studio to set data and monitor the data in the 2 controllers, verify the operation of the EtherNet/IP Tag Datalink.

RS Logix 5000				Sysmac Stu	oit			
	Name 🛆	Value	٠	Name	Online value			
	⊡-OmronNJ:I.Data	{	}	▼ NJtoCL[0-3]				
	⊕-OmronNJ:I.Data[0]		1	NJtoCL[0]				
	+-OmronNJ:I.Data[1]		2	NJtoCL[1]	2			
	+-OmronNJ:I.Data[2]		3	NJtoCL[2]	3			
	+-OmronNJ:I.Data[3]		4	NJtoCL[3]	4			

## Data from NJ to CompactLogix

## Data from CompactLogix to NJ

RS Logix 5000			Sysmac Studio					
	Name 🛆	Value	•	_	Name		Online va	alue
	-OmronNJ:0.Data	{.	}	•	CLtoNJ[0-3]			
			11		CLtoNJ[0]		(	11
			12		CLtoNJ[1]			12
	OmronNJ:0.Data[2]		13		CLtoNJ[2]			13
			14		CLtoNJ[3]			14

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 34



# **EtherNet/IP Error Code Decoder**

1.) Go online with the Network Configurator.



2.) Upload from the PLC / MAC if the configuration in the EIP card is different from the Network Configurator.



3.) Right click the PLC / MAC and select 'Monitor'.



4.) Go to the 'Connection' tab. The error code is shown in 'Status'.

Monitor Device					×		
Controller Error Histor	v i I	ig Status	Etherr	net Information			
Status 1	Status 2	Connec	tion	Error History	- i		
⊢ Target Node Status				_			
044	044						
Start Connection St	op Connection						
Connection Status			$\square$	-1			
Connection Name		Туре	Status	_			
92.168.1.44 (#044	In	01:0204					
			-	_			
				Close			

QSG-NX-S-STANDALONE - Version 3.2 Feb. 27, 2015

Page 35



01.0100	Connection in use or duplicate forward open
01:0103	Transport class and trigger combination not supported
01:0106	Ownership Conflict
01:0107	Target connection not found
01.0108	Invalid network connection parameter
01:0109	
01:0110	Target for connection not configured
01:0111	RPI not supported
01.0113	Out of connections
01:0114	Vendor ID or Product Code mismatch
01:0115	Product Type Mismatch
01:0116	Revision Mismatch
01:0117	Invalid Produced or Consumed application path
	This could be Tag Names that do not match in the PLC
01:0118	Invalid or inconsistent configuration application path
01:0119	Non-Listen only connection not opened
01·011A	Target object out of connections
01:011B	RPL is smaller than the production inhibit time
01:0110	Transport Class Not Supported
01:011D	Production Triager Not Supported
01:011E	Direction Not Supported
01:011E	Invalid Originator to Target Network Connection FIXVAR
01:0120	Invalid Cirginator to Originator Network Connection FIXVAR
01:0120	Invalid Originator to Target Network Connection Priority
01:0122	Invalid Target to Originator Network Connection Priority
01:0123	Invalid Originator to Target Network Connection Type
01:0124	Invalid Target to Originator Network Connection Type
01:0125	Invalid Originator to Target Network Connection Redundant Owner
01:0126	Invalid Configuration Size
01:0127	Invalid Originator to Target Size
01:0128	Invalid Target to Originator Size
01:0129	Invalid Configuration Application Path
01:012A	Invalid Consuming Application Path
01:012B	Invalid Producing Application Path
01:012C	Configuration Symbol Does Not Exist
01:012D	Consuming Symbol Does Not Exist
01:012E	Producing Symbol Does Not Exist
01:012F	Inconsistent Application Path Combination
01:0130	Inconsistent Consume Data Format
01:0131	Inconsistent Produce Data Format
01:0132	Null Forward Open Function Not Supported
01:0133	Connection Timeout Multiplier Not Acceptable
01:0203	Connection timed out
01:0204	Unconnected request timed out
01:0205	Parameter error in unconnected request service
01:0206	Message too large for unconnected send service

5.)	Us	se the	e list	to	find	the	status	code	and	descri	ption	of	the	failure	e.
-----	----	--------	--------	----	------	-----	--------	------	-----	--------	-------	----	-----	---------	----



01:0207	Unconnected acknowledgement without reply
01:0301	No buffer memory available
01:0302	Network bandwidth not available for data
01:0303	No consumed connection ID filter available
01:0304	Not configured to send scheduled priority data
01:0305	Schedule signature mismatch
01:0306	Schedule signature validation not possible
01:0311	Port not available
01:0312	Link address not valid
01:0315	Invalid segment in connection path
01:0316	Error in Forward Close service connection path
01:0317	Scheduling not specified
01:0318	Link address to self invalid
01:0319	Secondary resource unavailable
01:031A	Rack connection already established
01:031B	Module connection already established
01:031C	Miscellaneous
01:031D	Redundant connection mismatch
01:031E	No more user configurable link consumer resources
	available in the producing module
01:031F	No more user configurable link consumer resources
	available in the producing module
01:0800	Network link in path to module is offline
01:0810	No target application data available
01:0811	No originator application data available



#### OMRON AUTOMATION AND SAFETY • THE AMERICAS HEADQUARTERS • Chicago, IL USA • 847.843.7900 • 800.556.6766 • www.omron247.com

OMRON CANADA, INC. • HEAD OFFICE Toronto, ON, Canada • 416.286.6465 • 866.986.6766 • www.omron247.com

OMRON ELECTRONICS DE MEXICO • HEAD OFFICE México DF • 52.55.59.01.43.00 • 01-800-226-6766 • mela@omron.com

OMRON ELECTRONICS DE MEXICO · SALES OFFICE Apodaca, N.L. · 52.81.11.56.99.20 · 01-800-226-6766 · mela@omron.com

OMRON ELETRÔNICA DO BRASIL LTDA • HEAD OFFICE São Paulo, SP, Brasil • 55.11.2101.6300 • www.omron.com.br OMRON ARGENTINA • SALES OFFICE Cono Sur • 54.11.4783.5300

**OMRON CHILE • SALES OFFICE** Santiago • 56.9.9917.3920

OTHER OMRON LATIN AMERICA SALES 54.11.4783.5300

OMRON EUROPE B.V. • Wegalaan 67-69, NL-2132 JD, Hoofddorp, The Netherlands. • +31 (0) 23 568 13 00 • www.industrial.omron.eu

Authorized Distributor:

#### **Automation Control Systems**

Machine Automation Controllers (MAC) • Programmable Controllers (PLC)
 Operator interfaces (HMI) • Distributed I/O • Software

#### **Drives & Motion Controls**

Servo & AC Drives 
 Motion Controllers & Encoders

#### **Temperature & Process Controllers**

• Single and Multi-loop Controllers

#### **Sensors & Vision**

- Proximity Sensors Photoelectric Sensors Fiber-Optic Sensors
- Amplified Photomicrosensors 
   Measurement Sensors
- Ultrasonic Sensors 
   Vision Sensors

#### Industrial Components

- RFID/Code Readers Relays Pushbuttons & Indicators
- Limit and Basic Switches 
   Timers 
   Counters 
   Metering Devices
- Power Supplies

#### Safety

Laser Scanners • Safety Mats • Edges and Bumpers • Programmable Safety
 Controllers • Light Curtains • Safety Relays • Safety Interlock Switches