T. Integration into EtherNet/IP Networks

102

€ EECO

FlashGard* Communicating Motor Control Center

· MCC-TC

of legacy fiel

F.14

strial Network

EtherNet/IP



INTRODUCTION	4
Overview	5
Pre-requisite Skills	6
Required Hardware/Software	6
RSLINX	7
Starting EDS Wizard	8
Registering EDS with the Wizard	9
Confirm Task and Complete	10
STUDIO 5000 PART 1	11
Project Configuration	12
Creating Eaton EtherNet/IP Module	13-17

EATON'S ETHERNET CONFIGURATOR 1.3.16	19
Start Up	20
Configure	21-25
Save CSV	25
STUDIO 5000 PART 2	26
Importing Eaton's I/O Generated Tags	27-28
Importing Eaton's Add-On Instruction & Map	29-31
APPENDICES A, B	35
A - Eaton Resource Download Links	36
B - Eaton Supported Products and Respected I/O Assembilies	37-38



INTRODUCTION

OVERVIEW

The purpose of this guide is to assist technicians and engineers in integrating Eaton's motor control products into a new or existing EtherNet/IP network, specifically Rockwell Automation (RA) Programmable Logic Controllers (PLC). EtherNet/IP (EIP) is being used in a wide range of industries and is one of the fastest growing industrial protocols in the United States. EtherNet/IP is an open source implementation, thus allowing for the continuous development and support from industry leaders (such as Eaton), and ensuring that this industrial application layer protocol support sustainability.

Instructions and examples will be based on Eaton EIP Assist tool, Eaton add-on instructions, RSLINX, and a Compact/ControlLogix[™] PLC platform, configured with the RSLogix 5000 or Studio 5000 (RS5K) software environment. This guide will navigate, configure and explore the functionality of Eaton EIP-Assist I/O Tag Generation tool.

The EIP I/O Tag Generation tool was developed to allow technicians and engineers to select multiple Eaton EtherNet/IP products, their functions (pre-defined I/O assemblies), and then output the compiled data to a Comma Separated Value (CSV) file.

Once imported into the RS5K environment, these tags are then aliased to generic tags created when adding the Eaton module[s], thus simplifying integration and reducing commissioning time.

USE OF THIS INFORMATION/ DOCUMENTATION

Nothing in this document or any information or data derived from this document may be published distributed or copied nor may the information or data be used to create derivative works. No user of this information or data may allow or enable others to reverse engineer, decompile, disassemble or otherwise attempt to reconstruct, identify or discover any code, underlying ideas, techniques or algorithms from this information. No confidential information or proprietary rights or data may be removed, obscured or altered.

All proprietary and ownership rights belonging to EECO shall remain with EECO, and nothing in this document shall relinquish such rights, title or interest.

INDEMNIFICATION

EECO shall be indemnified and held harmless from any and all claims, damages, losses and/or expenses, including reasonable attorney's fees, arising from any breach of this agreement or the users obligations hereunder.





WARRANTY DISCLAIMER

This document is to be used "As Is" without warranty of any kind. EECO, on behalf of itself and any affiliates, hereby disclaims all representations, promises or warranties, whether express or implied with respect to the information contained herein. EECO specifically disclaims all implied warranties or merchantability, noninfringement, suitability and fitness for any particular purpose.

PRE-REQUISITE SKILLS

This document is written and intended for technicians and engineers who will be commissioning and/or supporting Eaton's motor control product on the plant floor. The intended users should know, at the very least, familiarity with navigating through the RS5K software environment.

REQUIRED HARDWARE/SOFTWARE

- 1. Eaton Motor Control Products (DG1 & C445 in our case)
- 2. PC with RSLINX and RS5K
- Rockwell CompactLogix™ or ControlLogix™ PLC (1756-L71 ControlLogix in our case)

* Note: All Eaton EDS files and software may be downloaded from Eaton. com via links provided in the Appendices



ROCKWELL AUTOMATION ENVIORNMENTS RSLINX





Let's start off by registering the EATON EDS files into RSLINX with the EDS Wizard.

Open the start menu and under RSLINX

STEP 1 :	Select the EDS Hardware
	Installation Tool
STEP 2:	Select add



Beginning with **v20 of RS5K**, this may be accomplished with other additional options within the environment under the **Tools Menu**.



STEP 3: Browse t	to the folder dire	ectory containing	the EDS[s]
------------------	--------------------	-------------------	------------

STEP 4:	Click next
---------	------------

83 Rockwell Automation's EDS Wizard Registration Y Electronic Data Sheet file(s) will be added to your system for use in Rockwell Automation applications C Register a single file · Register a directory of EDS files ✓ Look in subfolders In folder C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNet Browse (\mathbf{i}) * If there is an icon file (ico) with the same name as the file(s) you are registering then this image will be associated with the device To perform an installation test on the file(s), click Next Next > Cancel

The system will do a scan and *populate a test result*.

STEP 5:	Select the desired file[s] to register
STEP 6:	Click next

Rockwell Automation's EDS Wizard EDS File Installation Test Results This test evaluates each EDS file for errors in the EDS file. This test does not guarantee EDS file validity - Installation Test Results C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_V\900(E-C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 - C:\Usera\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_\C44 📴 💩 C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_V\C441 🗉 B- C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_V\C44 C:\Usors\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_V\C44 . C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 B- C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 C:\Usera\ksorsenginh\Documenta\Controla\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R_T_U_VC44 C:\Users\ksorsenginh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS)C441R_T_U_VC44* C:\Users\ksorsenainh\Documents\Controls\EATON\EDS Files\EtherNetIP Electronic Data Sheet (EDS) C441R T U V\C44' View file ... < Back Next > Cancel





- 22

Next >

Cancel

Change the icons if needed

STEP 7: Click **next**

A final task summary window will appear. Ensure the information is correct.

STEP 8: Click **next** to complete the EDS registration process





STUDIO 5000 **PART 1**



STEP 1: Open or **create** a new project in RS5K.

If starting a new project -

- **STEP 2:** Select the processor and name your project
- **STEP 3: Browse** to the desired project save location
- STEP 4: Click next



New Project

1756-L71 ControlLogix@ 5570 Controller

ECC0 EIP_INTEGRATION_NEW_DEMO

Revision:

30 •

Chassis:

1756-A7

7-Slot ControlLogix Chassis

Slot:

0 •

Description:

EECO EIP INTEGRATION - EATON

Redundancy:

Enable

Cancel

Back

Next

- **STEP 5:** Select the **chassis type**
- STEP 6: Click finish







In the Controller Organizer -

STEP 7: Right click the processor Backplane (slot 0)

STEP 8: Create a new Ethernet module.

For this example, the 1756-EN2T will be used. Click **create**

STEP 9: Name the EN2T and input an unused IP Address (192.168.0.2)

STEP 10: Click OK

An EN2T module (slot 1) now exists under the Backplane.

Mine 🛛 🚛 RUN	Catalog Module Discovery Fa	avortes		
lo Forces				
o Edits	Enter Search Text for Modu	le Type Clear Filters		
ledundancy 3-0				
Controller Organizer	Module Type Categor	y Filters		
Controller EECO_EIP_INTEGRAT	Analog Communication Controller Digital Drive			
A MainTask	Catalog Number	Description	Vendor	Category
	124x	Single or Dual Resolver Interface	Advanced Micro.	Specialty
- C Motion Groups	1756-CFM	Configurable Flow Meter	Allen-Bradley	Specialty
Langrouped Aves	1756-CN2	1756 ControlNet Bridge	Allen-Bradley	Communication
Add-On Instructions	1756-CN2R	1756 ControlNet Bridge	Allen-Bradley	Communication
Data Tunar	1756-CNB	1756 ControlNet Bridge	Allen-Bradley	Communication
Liker Defined	1756-CNBR	1756 ControlNet Bridge, Redundant Media	Allen-Bradley	Communication
Charles Charles	1756-DHRIO	1756 DH+ Bridge/RIO Scanner	Allen-Bradley	Communication
Canada Co. Defend	1756-DMA30	1756 SA3000 Drive Interface	Allen-Bradley	Drive
Add-Un-Defined	1756-DMA31	1756 SA3100 Drive Interface	Allen-Bradley	Drive
H Predefined	1756-DMA50	1756 SA500 Drive Interface	Allen-Bradley	Drive
Module-Defined	1756-DMB30	1756 SB3000 Drive Interface	Allen-Bradley	Drive
Trends	1756-DMD30	1756 SD3000 Drive Interface	Allen-Bradley	Drive
- R. Logical Model	1756-DMF30	1756 SF3000 Drive Interface	Allen-Bradley	Drive
B di I/O Configuration	1756-DNB	1756 DeviceNet Scanner	Allen-Bradley	Communication
1756 Backplane, 1756-A7	1756-EN2F	1756 10/100 Mbps Ethemet Bridge. Fiber Media	Alen-Bradley	Communication
[0] 1756-L71 EECO_EIP_II	1756-EN2T	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley	Communication
	1756-EN2TR	1756 10/100 Mbps Ethemet Bridge, 2-Port, Twisted P	Allen-Bradley	Communication
	1756-EN2TSC	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Medi	Allen-Bradley	Communication
	1756-EN3TR	1756 10/100 Mbps Ethemet Bridge, 2-Port, Twisted-P.	Allen-Bradley	Communication
	1756-ENBF	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley	Communication
	1756-ENBT	1756 10/100 Mbps Ethemet Bridge, Twisted-Pair Media	Allen-Bradley	Communication

General*	Connection	RSNetWorx	Module Info	Internet Protocol	Port Configuration	Time Sync		
Type: Vendor: Parent:	1756 Allen Loca	6-EN2T 1756 10 I-Bradley	0/100 Mbps Et	hemet Bridge, Twis	ed-Pair Media Ethernet Address		Change Type	•
Name:	EN2	T			Private Netwo	rk: 192	2.168.1.	
Description	on: Ethe	erNet Module		*	IP Address: Host Name:	192 . 16	8.0.k	
Revisio Electron Rack C Time S	n: nic Keying: Connection: ync Connec	10.00 Comp None tion: None	Ch atible Module	ange	Slot:	1 -		



Multiple Eaton devices will be added to the project using different methods, with or without an EDS file. The PowerXL DG1 VFD will be added as a Generic Ethernet Module and a C445 Smart Motor Protection Device will be utilizing the previously registered EDS file. Using an EDS file allows technicians and engineers to select the I/O Assembly pair directly from a drop down list instead of having to input manually.



STEP 11; Right click on the 1756-EN2T module

STEP 12: Select create new module

Next, the Select Module Type window appears. To enter the DG1 as a Generic Ethernet Module -

- STEP 13: Deselect both filters for Category and Vendor and select only Communication and Allen-Bradley
- STEP 14:Scroll down toward the bottom of the list and select ETHERNET-MODULE Generic
Ethernet Module
 - Click **create**

A New Module window will appear. See following page for instructions on adding the next Eaton device.

Catalon Madda Discourse Enum						Catalog Number	Description	Vendor	Category	
Enter Search Text for Module Tip Enter Search Text for Module Tip Module Type Category Fil Digital Digital Digital Dial Port EtherNet DPI to EtherNet/IP	tes ipoClear Filters ters			Ale Adv Bau	idule Type I in Bradley vanced Ene umueller	783-2MS4T4E2TGP 783-2MS4T4E2TGP 783-2MS4T8E2TGP 783-2MS4T8E2TGP 783-2MS4T8E2TGP 783-EN20NR 788-EN20NR 788-EN20NR0M 789-EN8T 754-AENT 754-AENT	Amotheria 5700 10 Port Managed Switch, Gipaki Liu, Amotheria 5700 10 Port Managed Switch, Gipaki Liu, Amotheria 5700 10 Port Managed Switch, Gipaki Liu, Amotheria 5700 10 Port Managed Switch, Gipaki Liu, Manada Katala, Santa Switch, Gipaki Liu, 1738 Elbrantis Dencember Liuhing Dence 1738 Bruntis Dencember Liuhing Dence 1739 Bruntis Dencember Liuhing Dence 1730 Bruntis Dencember Liuhing Dencember Liuhing Dence 1730 Bruntis Dencember Liuhing Dencember Liuhing 1730 Bruntis Dencember	Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey Alen Bradey	Computing States Communication Communication Communication Communication Communication Communication Communication Communication	New Module 32 Type: ETHERNET-MODULE Generic Ethernet Module Viewdor: Alex Ethernet Parcet: BN2T Description: Assembly Instance: Provid: 7 3
DNi to BiherNet/IP Catalog Number	Description	Vender	Category	- Eat	on Bectrica	794-AENTR 93-DNENCAT 93-DNENCATR https://www.sci.com/s	1754 10/100 Mbps Ethemet Adepter, 2-Port, Twisted Ethemet to DeviceNet Communications Audiary Ethemet to DeviceNet Communications Audiary, 2-Port 10/100 Mbps Ethemet Port on DriveLogis5730	Alen Bradley Alen Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication Communication	
1783-ZMS4T4E2TGP 1783-ZMS8T8E2TGN 1783-ZMS8T8E2TGP	AmorStratix 5700 10 Port Managed Switch, Gigabit Up AmorStratix 5700 18 Port Managed Switch, Gigabit Up AmorStratix 5700 18 Port Managed Switch, Gigabit Up	Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication	New Module		1 Plus therNet/IP THERNET-BRIDGE THERNET-MODULE	Bestronic Overload Relay Communications Interface SoftLogis5800 EtherNet/IP Genetic EtherNet/IP CIP Bidge Genetic Ethernet Module	Alen Bradley Alen Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication Communication	Ø: IP Addees 132 - 168 - 0 - 100 Statistic providence IP Host Name Statistic Dutation Statistic Dutation
1783-ZMS8TA 1788-EN2DN 1788-EN2DNR 1788-EN2DNR	AmorStatix 5700 8 Port Managed Switch, Full FW 1788 Ethemet to DeviceNet Linking Device 1788 Ethemet to DeviceNet Linking Device, 2-Port 1789 Ethemet to DeviceNet Linking Device, 2-Port	Alen-Bradley Alen-Bradley Alen-Bradley Man-Bradley	Communication Communication Communication	Type: Vendor: Parent:	ETHERI Alen-Bra EN2T	kratix 8000 kratix 8000 kratix 8000 kratix 8000	6 Port Managed Switch 10 Port Managed Switch 14 Port Managed Switch 18 Port Managed Switch	Alen-Bradley Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication	(2) Open Module Properties OK Cancel Help
1788-ENBT 1794-AENF 1794-AENT	1788 10/100 Mbps Ehemet Bridge. Twisted-Pair Media 1794 10/100 Mbps Ehemet Adapter, Fiber Media 1794 10/100 Mbps Ehemet Adapter, Twisted-Pair Me.	Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication	Name. Description:	DG1	kratix 8000 kratix 8000 kratix 8300 kratix 8300	22 Port Managed Switch 26 Port Managed Switch 6 Port Layer 3 Managed Switch 10 Port Layer 3 Managed Switch	Alen Bradley Alen-Bradley Alen-Bradley Alen Bradley	Communication Communication Communication Communication	
1794-AENTR 193-DNENCAT 193-DNENCATR Drivelogix5730 Ethernet	1734 10/100 Mpps Ethemet Adapter, 2Port, Twisted Ethemet to DeviceNet Communications Audiary Ethemet to DeviceNet Communications Audiary, 2-Port 10/100 Mpps Ethemet Port on DriveLogic5730	Alen-Bradley Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication	Comm Forms Address /	st: Data - II Host Name	kratix 8300 kratix 8300 kratix 8300 kratix 8300	14 Post Layer 3 Managed Switch 18 Post Layer 3 Managed Switch 22 Post Layer 3 Managed Switch 26 Post Layer 3 Managed Switch	Alen-Bradley Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication	
E1 Plus EtherNet/IP ETHERNET-BRIDGE ETHERNET-MODULE	Bectronic Overfoad Relay Communications Interface SoftLogo/S800 EtherNet/IP Genetic EtherNet/IP CIP Bridge Genetic Ethernet Module	Alen-Bradley Alen-Bradley Alen-Bradley Alen-Bradley	Communication Communication Communication Communication	IP Add Host N	kess: 1 Jame:	2458 Module Types Fo	und			Add to Favorite
Stratix 8000 Stratix 8000	6 Port Managed Switch 10 Port Managed Switch	Alen-Bradley Alen-Bradley	Communication Communication	Open Moo	dule Propert	ise on Create				Create Close /

EATON Integration into EtherNet/IP Networks

- **STEP 16:** Input a name that is distinctive yet simple **(DG1)** as you will need to reuse this identical name in the EIP Assist Software
- **STEP 17:** Change the Comm Format from **DINT >> INT**
- STEP 18: Input an unused IP Address (192.168.0.100 that is on the same subnet as the EN2T, i.e. 192.168.0.x. {x = 2-254}
- STEP 19: Input 73 for the Input Assembly Instance, size = 3 bytes (INT) (pg. 66 in DG1 Manual)
- STEP 20: Input 23 for the Output Assembly Instance, size
 = 3 bytes (INT) (pg. 62 in DG1 Manual)
- STEP 21: Configuration assembly is not used, but there must be a value there as a place holder so input 1 for Configuration Assembly Instance, size = 0

Adding the next Eaton device, a **C445**, is similar to the previous steps with minor changes.

- **STEP 22:** Right click on the **1756-EN2T** module again and select create new module.
- **STEP 23:** The Select Module Type window reappears
- **STEP 24:** Deselect the filters for Vendor and select only Eaton Electrical

The list will only show Eaton devices based on the EDS files that were previously registered

- STEP 25: Select C445XC-E C445 EtherNet Communication Card
- STEP 26: Click create

A New Module window appears





14



EATON Integration into EtherNet/IP Networks

Input a name that is distinctive yet simple **(C445)** as you will need to reuse this identical name in the EIP Assist Software.

- **STEP 27:** Input an unused IP Address (192.168.0.101) that is on the same subnet as the EN2T, i.e. 192.168.0.x. {x = 2-254}.
- **STEP 28:** Click the change button
- **STEP 29:** Change the size from **SINT >> INT**

module biscovery [1]	svorites	General* Connect	son Module Info Internet Protocol			
Enter Search Text for Module Type Catego Ac Drive Device Analog CiP Motion Converter Communication Communication Catalog Number 0044_000C_0600 C441R C441T C441T C441U C441U C441U	ter Description ELC-CAENET C441 Ethemet 120VAC IO S411 Ethemet 120VAC IO S411 Ethemet 120VAC IO C441 Ethemet 120VAC IO C441 Ethemet 120VAC IO C441 Ethemet 120VAC IO S411 Ethemet 120VAC IO	Module Definition Revision:	At J wooden the J hermiter Holdool 445XIC-E C445 EtherNet Communication Card aton Bectrical THERNET_JP 2445 Eaton C445 Motor Protection 1.002 1002 1002 1.002 1.002 Compatible Module ExclusiveOwner	Ethomet Address Private Network: Private Network: Host Name.	192.168.1.	Hide Filters &
C441V C441V C441V C445xC-E D77D-EIP DG1 SVX/SPX9000	C441 Ethernet 24VDC IO S411+ Ethernet 24VDC IO S411+ Ethernet 24VDC IO C445 EtherNet Communication Card EtherNet/IP Adapter PowerXL DG1 9000X OPTCQ	Status: Creating	Ohange	ОК	Cancel Help	
		Bectronic Keying: Connections: Name ExclusiveOwner Collect a connection	Compatible Module Size Tag Si input 0 SiNT 1 SiNT SiNT DIT	rffix C445:11 «none»		
5 of 2458 Module Types Fi	sund	Bectronic Keying: Connections: Name ExclusiveOwner Collect a connection	Compatible Module Tag St input Output: SINT U SINT Dutput: Compatible Module Tag St Tag St	Iffix (C445:11 <none></none>		Add to Favorites



New Module Generation Module Mr. Merral Poisson Tax California / California / Module Mr. Merral Poisson Tax		
Corwell [®] Connectors Modula Info Internet Petersel Terrer (1995) 27 2925 Disable Compared on Cord		
New Care Data Pase: Pase: Pase:	Marce Marce Protochanat 192.01 () 8 P Adom 00 (0 - 00 () - 00) Nat Nov	(net film, n)
		fail to Faculture
	Partit Statistical (**) New ::::::::::::::::::::::::::::::::::::	Norm Charles (1) Norm Charles (1) <td< td=""></td<>

	Name	Requested Packet Interval (RPI) (ms)	Connecti over Ether	ion Nel/IP	Input Trigger	
Asm 106 OT - 110 T	D	20.0 🜩 5.0 - 5000.0	Unicast	-	Cyclic	
Major Fault On Co	ntroller If Connection	Fails While in Run Mode				
Inhibit Module	ntroller If Connection	Fails While in Run Mode				

STEP 30:Click on ExclusiveOwner and select the I/O Assembly on
106 OT - 110 TO.

Notice the size changed on the Input and Output to 11 & 1

STEP 31: Click **OK** and select **Yes**

Back on the New Module Window -

- **STEP 32:** Select the **Connection Tab** to change the RPI or select **OK**.
- **STEP 33:** Close the Select Module Type window.

In the Controller Tags window, notice the general tags that were created when we added the Eaton EtherNet/IP modules.

STEP 34: Save the project

*Ensure that the RS5K project file is saved periodically to mitigate the risk of losing data.

Yes

No

Change module definition?



Normally, technicians or engineers manually input information in the **Description column**, but this can take days if not weeks depending on the tag counts. Eaton recognized this barrier and developed the **EIP-Assist tool** to help technicians and engineers eliminate this burden.

At this point, allow RS5K to continue to run in the background. Let's navigate to the location where the Eaton EIP-Assist tool was downloaded.

ppe: DEECO_EIP_INTE -	Show: A	II Tags		▼, Enter Name F	iiter
Name		Alias For	Base Tag	Data Type	Description
-DG1:I				AB:ETHERNET	
- DG1:I.Data				INT[6]	
+ DG1:I.Data[0]				INT	
+ DG1:I.Data[1]				INT	
+ DG1:I.Data[2]				INT	
+ DG1:I.Data[3]				INT	
+-DG1:I.Data[4]		С.		INT	
+ DG1:I.Data[5]				INT	
-DG1:0		с. с		AB:ETHERNET	
- DG1:0.Data				INT[6]	
+ DG1:0.Data[0]				INT	
+-DG1:0.Data[1]				INT	
+-DG1:0.Data[2]				INT	
+ DG1:0.Data[3]				INT	
+-DG1:0.Data[4]				INT	
+ DG1:0.Data[5]				INT	
+-DG1:C				AB:ETHERNET	
-C445:I1				_0044:C445XC_E	
-C445:I1.ConnectionFaul	ted			BOOL	
+ C445:I1.Data				INT[11]	
-C445:01				_0044:C445XC_E	
- C445:01.Data				INT[1]	
TO CANE OF D 1 101		2	88	INIT	



EATON'S ETHERNET Configurator 1.3.16



- **STEP 1:** Start EIP-Assist by **double clicking the icon**.
- **STEP 2:** The splash screen will appear indicating the tool is initializing.





- EIP-Assist will ask if an EDS file is being used for the first product.
- **STEP 3:** In our case we did not use an EDS to add the DG1, so **select no**

Device Count Entry	×
Enter Number of Devices	OK Cancel
1	

	1 in our case
STEP 4:	Enter the number of DG1 devices we added to our project -

But if multiple DG1 were added, we could generate the tags in one instance utilizing EIP-Assist.

Product	Selected		
PowerXL	DG1	Will the Comm Format be INT, Yes is INT	and No is SINT
		Vet	No
	Select the I/O Assembly Pair		
	21/107 21/117 21/127 23/70 23/71		
	23/107 23/117 23/127 101/70		

STEP 5:	Select the appropriate DG1 I/O Assembly Pair as previously
	completed in the RS5K project; 23/73 in this example.

STEP 6: Comm Format was also set to INT, so **select yes**.

21



Browse for Folder	J
Select a folder where you want the CSV file to be stored	
 Desktop Network Libraries K Sorsenginh Source Computer EATON 	
OK Cancel	
Output File Name Entry	
Enter File Name OK Cancel	

Module Device Name Entry

Device 1 of 1 Enter Device Name: 10 Characters

Max

DG1

DG1

EECO EIP ASSIST DEMO

STEP 7: Browse to a location where the outputted CSV will be saved.

Please note the location as the CSV will need to be accessed at a later time.

STEP 8:	Name the CSV file to be outputted
This can be ar	nything. In this example, EECO EIP ASSIST DEMO will be used.
STEP 9:	Click OK
STEP 10:	Enter the DG1 Device Name as completed in the RS5K project - enter DG1
STEP 11:	Click OK
*THE NAME M tags!	1UST BE IDENTICAL in order for the tool to properly generate the desired



Eaton Ethernet Configurator	STEP 12 :	Select yes to configure the additional product
Do you want to configure more Products? Yes or No		
Yes No		
Eaton Ethernet Configurator	STEP 13:	The EIP-Assist tool will loop back to the original prompt of whether an EDS is to be utilized. Referring back to the second Eaton product that was added, the EDS file was indeed utilized.
Is an EDS File Being Used? Yes or No	STEP 14:	Select Yes
Yes No		
Select the product to configure C441R C441 120Vac I/O C441T C441 24Vdc I/O C441R S611 120Vac I/O C441R S611 120Vac I/O C441T S611 24Vdc I/O C441U C440 120Vac I/O C441V C440 24Vdc I/O C441U S811+ 120Vac I/O C441U S811+ 120Vac I/O C441U VO 24Vdc I/O SVX/SPX 9000 9000X OPTCQ PowerXL DG1 PowerXL DA1	STEP 15:	Select Power Xpert C445

EECO | 1440 Diggs Dr. Raleigh, NC 27603 | 919-828-5411 | www.eecoonline.com



Device Count Entry	x
Enter Number of Devices	ОК
	Cancel

105/116	
105/121	
106/50	
106/51	
106/52	
106/54	
106/100	
106/107	
106/110	
106/116	E
106/121	-

Eaton Ethernet Configurato	pr	×
Will the Comm Format b	e INT, Yes is INT an	d No is SINT
	Yes	No

Similar to the DG1 instance -

STEP 16: Input the **value of 1** for the C445 Device count. *If additional C445s were added, enter the corresponding value.*

STEP 17: Select the 106/110 I/O Assembly Pair as in the RS5K Project

STEP 17: Click **Yes** for Comm Format INT



Device 1 of 1 Max	Enter Device Name: 10 Characters	OK
		Cancel
		Cancer





STEP 17: Enter the **C445 Device Name** as completed in the RS5K project

*THE NAME MUST BE IDENTICAL in order for the tool to properly generate the desired tags!

- STEP 18: Click OK
- **STEP 19:** Select **No** for configuring additional product.

A final window will pop up to show the CSV file name and folder location.

STEP 20: Click OK

EIP-Assist will automatically close any remaining windows and the task is completed.



STUDIO 5000 PART 2



Navigate back to the RS5K environment -

STEP 1: Go to the **Tools Menu** > **Import** > **Tags** and Logic Comments

ation	s Too	ols Window Help	_		_	_	_
		Options		2255		1	,
	_	Security			99	Select	anguaye
	9	Documentation Languages	品				
<u> </u>	1	Import		Tags	and <u>L</u> ogic	Commen	ts
Y		Export +	_	Com	ponent		nput
	9	EDS Hardware Installation Tool					
×	r	Motion >					
		Monitor Equipment Phases	plicr)				
		Pl <u>ug</u> -In Manager			Race Ta	-	▼ Y. Bill
		Custom Tools			Dase Ta	9	AB:ETHER
	120	Translate PLC 5/SLC 2.0	-				INT[6]
		ControlELASI I					INT
		ClearKeener			-		INI
	60	Logix CPLI Security Tool	-		-		INT
	90	RSL only 5000 IEC61131-3 Translation Tool	-				INT
		Tag Data Monitor Tool			-		INT
		Lag Upload Download Lool					AB:ETHER
	90-1 10-10-1	Page 10 Dec 2 Server					INT[6]
		Dublish to DELMIA Automation					INT
	1	Publish to DELIVIA Automation					INT
	0	Import from DELINIA Automation					INT
		Online Books					INT
		Logix5000 Task Monitor					INT
	Ø	Logix5000 Clock Update Tool					INT
	1	DeviceNet Tag <u>G</u> enerator					AB:ETHER
		Co <u>m</u> pare Tool					_0044:C44
	1	RSLogix5000 Data Preserved Download Tool					BOOL
		+ C440.11.Data	-				INT[11]

STEP 2: Browse to the previously saved CSV folder location, **select**, and **import**



27



Once the import task is completed, you will notice the lower Error plane that provides feedback on how many tags were created, along with any errors and warnings.

*If there are error[s], ensure that the names specified in the project and EIP-Assist were identical, or re-run EIP-Assist with the correct nomenclature.

Also notice that the description column is now automatically populated from the EIP-Assist generated CSV. When **Edit Tags** is selected, RS5K will also show exactly where the new tags are alias to in the generic tags. The functionalities of the EIP-Assist tool contribute to the reduction of setup or commissioning time by a great amount, ultimately reducing downtime and increasing productivity. *The import task is now completed*.

cope: DEECO_EIP_INTE - Show	All Togs		1		_		
Name -2	∧ Alias For	Base Tag	Data Type	Description	External Access	Constant	S
DG1_TorqueActual	DG11 Data[2]	DG11 Data[2]	INT	Torque Actual	Read/Write		D
DG1_RunFwd	DG1:0.Data[0].0	DG1:0.Data[0].0	BOOL	Run Forward	Read/Write		D
DG1_RunRev	DG1:0.Data[0].1	DG1:0.Data[0].1	BOOL	Run Reverse	Read/Write		D
DG1_FaultReset	DG1:0.Data[0].2	DG1:0.Data[0].2	BOOL	Fault Reset	Read/Write		D
DG1_NetCtrl	DG1:0.Data[0].5	DG1:0.Data[0].5	BOOL	Net Ctrl	Read/Write		D
DG1_NetRef	DG1:0.Data[0].6	DG1:0.Data[0].6	BOOL	Net Reference	Read/Write		D
+-DG1_SpeedReference	DG1:0.Data[1]	DG1:0.Data[1]	INT	Speed Reference	Read/Write		D
+-DG1_TorqueReference	DG1:0.Data[2]	DG1:0.Data[2]	INT	Torque Reference	Read/Write		D
C445_DevStatusTrip	C445:I1.Data[0].0	C445:11.Data[0].0	BOOL	Device Status Faulted/Tripped	Read/Write		D
C445_DevStatusWam	C445:I1.Data[0].1	C445:11.Data[0].1	BOOL	Device Status Warning	Read/Write		D
C445_DevStatusOut1	C445:I1.Data[0].2	C445:11.Data[0].2	BOOL	Device Status Out1	Read/Write		D
C445_DevStatusOut2	C445:I1.Data[0].3	C445:11.Data[0].3	BOOL	Device Status Out2	Read/Write		D
C445_DevStatusIn1	C445:I1.Data[0].4	C445:11.Data[0].4	BOOL	Device Status Input1	Read/Write		D
C445_DevStatusIn2	C445:I1.Data[0].5	C445:11.Data[0].5	BOOL	Device Status Input2	Read/Write		D
C445_DevStatusIn3	C445:11.Data[0].6	C445:11.Data[0].G	BOOL	Device Status Input3	Read/Write		D
C445_DevStatusIn4	C445.I1.Data[0].7	C445.I1.Data[0].7	BOOL	Device Status Input4	Read/Write		D
C445_DevStatusRun1	C445.I1.Data[0].8	C445.11.Data[0].8	BOOL	Device Status Running 1	Read/Write		D
C445_DevStatusRun2	C445.11.Data[0].9	C445.I1.Data[0].9	BOOL	Device Device Running 2	Read/Write		D
C445_DevStatusRemote	C445.I1.Data[0].10	C445.I1.Data[0].10	BOOL	Device Status Remote or CtrlFromNet	Read/Write		D
C445_DevStatusOut3	C445:I1.Data[0].11	C445:I1.Data[0].11	BOOL	Device Status Output 3	Read/Write		D
C445_DevStatusInhibt	C445:11.Data[0].13	C445:11.Data[0].13	BOOL	Device Status Inhibited	Read/Write		D
C445_DevStatusReady	C445:11.Data[0].14	C445:I1.Data[0].14	BOOL	Device Status Ready	Read/Write		D
C445_DevStatusAtRef	C445:I1.Data[0].15	C445:I1.Data[0].15	BOOL	Device Status At Ref or Up To Speed	Read/Write		D
E-C445_Current11	C445:11.Data[1]	C445:11.Data[1]	INT	Device Status Current PhaseA	Read/Write		D
F C445_Current12	C445:11.Data[2]	C445:11.Data[2]	INT	Device Status Current PhaseB Low	Read/Write		D
+ C445_Current13	C445:11.Data[3]	C445:11.Data[3]	INT	Device Status Current PhaseC Low	Read/Write		D

Errors Iotals:

	82 tags created
	0 tags overwritten on collision
	82 descriptions imported
	0 descriptions deleted
	0 new program connections imported
	0 program connections duplicates discarded on collision
	0 new comments imported
	0 comments overwritten on collision
	U comments deleted on collision
Co	mplete — 0 errors, 0 warnings



3 L	ogix Designer - EECO_EIP_INTEGRATION [175	6-L71 3	0.11]			
File	Edit View Search Logic Communica	ations	Tools	Window	Help	
ê 2	<u>N</u> ew <u>O</u> pen <u>C</u> lose	Ctrl+N Ctrl+C		ETH-EEC	CO\192.168.0.13	Bac
	<u>S</u> ave Save <u>A</u> s	Ctrl+S			Favo	⊣ h _e
	Ne <u>w</u> Component					1
	Import Component			Add-On I	nstruction	
	Co <u>m</u> pact			Data Type Equipmen	e nt Phase	EGI
	Page Set <u>u</u> p			Equipmer	nt Sequen <u>c</u> e	how
	Generate Report		_	Program.		=
	Print		•	Routine		H
	Print Op <u>t</u> ions		C an	String Typ	pe	E
	1 EECO EIP INTEGRATION.ACD		2	Tre <u>n</u> d		
	2 FECO SMART 05182017v2 ACD			DG1_NetCtrl		
	2 EECO SMART 05252017-4 ACD			DG1_NetRef	f	



Eaton has taken additional steps to simplifying integration of its EtherNet/IP supported products by offering a wide range of *Add-On Instruction (AOI)* that may be used in conjunction with or without EIP-Assist.

The **AOI method** is the preferred method of commissioning Eaton's smart devices as the front end work of mapping, combining two byte/ word tags into an INT, DINT, or REAL, and the scaling has already been completed.

Technicians and engineers will then focus only on the application programming phase. Let's proceed and explore how technicians and engineers can utilize Eaton's AOIs.

In RS5K -

- STEP 4:
 Navigate to File > Import Component > Add-On

 Instruction
- **STEP 5:** Browse to the **AOI provided by Eaton**

The extension of the file will be a **L5X**.

STEP 6: The medium frame size C445 AOI is selected.

29



같 또 Find:	- A A	Find/Replace		
Find Within: Final Name				
port Content:				
🖶 Add-On Instructions	Configure Add-0	n Instruction Properties		
C445_AOI_106_110_Medit Parameters and Local Tags	Import Name:	C445_AOI_106_110_MediumFra	ameSize	
Routines	Operation:	Create	•	D
• 🔯 Errors/Warnings	Final Name:	C445_AOI_106_110_MediumFr	ames 🗸	Properties.
	Description:	Input Assembly 110 Output Assembly 106 4.0 - 72.0 amps	*	
			-	
	Revision: Revision Note: Vendor:	v1.0		
			· · · · · · ·	

.11]* ools Window Help - 🏘 🐴 🙀 📴 🏦 📝 🖼 🍳 🔍 Select language.. - 🥪 ... ETH-EECO\192.168.0.13\Backplane\0 👻 🔡 ath: + Fave Add-... C445_AOI_106_110_MediumFrameSize v1.0 Fil & Fil & Seq & Equ C445_AOI_106_110_MediumFrameSize-Input Assembly 110Output Assembly 108 C445 AOI 106 110 Med ... ? input H MainProgram Add-On Instruction Parameters and Lo E 23 Output Comma_Status (Status_Input3) C445_AOI_106_110_Med 曲 鹽 騷 Scope . 77 -(Status_Input4)-Run1 ?? Data Context C445_A01_106_110_Me Run2 77 ?? ?? Fault_Reset ۲ Name .* 😁 Enable_CtrlFromNet Output1 Output2 Current_AVG Comm_MSG_Error 27 Properties Comms Status (End) Current_AVG Voltage_AVG 77 Current_L1 Current_L2 REAL Output Current_L3 REAL Output Enable CtrlFromNet Input BOOL EnableIn BOOL Input Enable Input - System Def EnableOut Output DOOL Enable Output - System D

The Import Configuration window appears.

STEP 7: Verify and select OK

STEP 8:

In the Controller Organizer > Add- On Instruction, the AOI has been successfully imported and is now available for use in the Language Element Tool Bar > Add-On





STEP 9: In **MainProgram** > **Parameters and Local Tags**, it's apparent that RS5K created the AOI I/O tags within this location.

Ø	Program Parameters and Local Tags - I	MainProgr	am	
S	cope: 🙀 Main Program 👻 Show: A	VI Tags	* 7	Enter Name Filter
	Name == 🛆	Usage	Alias For	Base Tag
	. −C445	Local		
Þ				



	Name		Usage	Ali
	Comm_MSG_Error		Output	
	Comms_Status		Input	
	Current_AVG		Output	
	Current_L1		Output	
	Current_L2	5	Output	
	Current_L3	1	Output	
	Enable_CtrlFromNet		Input	
	EnableIn		Input	
	EnableOut		Output	
	Exceeds_StartsLimit		Output	
	Fault_Reset		Input	
	Freq_Dev_Fast		Output	
	Freq_Dev_Slow		Output	
	HighPower		Output	1
	HighRes_GF		Output	
	I_PhaseLoss		Output	
	I_Unbalance		Output	1
	Init_Fault		Output	
	+-Input		InOut	
	Inst_OC	i.	Output	
N	Jam		Output	
	LowPower		Output	1
	NV_Memory_Fault	5	Output	
	+-Output		InOut	
	0D.			_



UTILIZING THE AOI



cope: DEECO_EIP_INTE - S	how: All Tag	IS	-
Name	EB & Alias	For	Base Tag
-DG1:I			
	2		
+-DG1:O.Data	1 1		
+-DG1:C			
-C445:I1			
-C445:I1.ConnectionFaulted	Č.		
+ C445:I1.Data			
-C445:01			
- C445:01.Data			
+ C445:01.Data[0]			
DG1_StatusFaulted	DG1	:I.Data[0].0	DG1:I.Data[0].0
DG1_StatusWarning	DG1	:I.Data[0].1	DG1:I.Data[0].1
DG1_StatusRunning1	DG1	:I.Data[0].2	DG1:I.Data[0].2
DG1_StatusRunning2	DG1	:I.Data[0].3	DG1:I.Data[0].3
DG1_StatusReady	DG1	:I.Data[0].4	DG1:I.Data[0].4
DG1_StatusCtrlFromNet	DG1	I Data[0] 5	DG1:LData[0].5

 Inpu	ut Assembly 110	
Outp	out Assembly 106	
4.	.0 - 72.0 amps	
C445_AOI_106_110_Med	liumFrameSize	7
input Assembly 1100utput As	ssembly 1064.0 - 7	(Olation Front Trip)
C445_A0I_106_110_Med	C445 []	-(Status_Fault_Trip)-
Input	C445:I1.Data	-(Status_Input1)
Output	C445:01.Data	-(Status_Input2)
Comms_Status C445:I1.Con	nectionFaulted	-(Status_Input3)-
	0 ←	-(Status_Input4)
Run1	0 ←	-(Status_Running1)-
Run2	0 ←	-(Status_Running2)-
Fault_Reset	0 ←	-(Status_Remote_Mode)
Enable_CtrlFromNet	0 ←	-(Status_Inhibited)-
Output1	0 ←	

	STEP 1:	Next, open MainProgram – MainRoutine
	STEP 2:	Add a rung
	STEP 3:	Then in Add-On, drag the C445 AOI to the rung O
	Once the C44 in the AOI bloc	5 AOI block is added to the rung, the top three parameters ok must be mapped to a specific module.
	Within the AO	l block -
	STEP 4:	Double click the top "?" next to the View Configuration Dialog button
	STEP 5:	Input C445 > right click > select "New C445"
	STEP 6:	A new Parameter or Tag window will appear
	STEP 7:	Confirm the name and scope
1	STEP 8:	Click create
	Ensure that the side-by-side.	e Controller Tags and MainProgram windows are open and
	STEP 9:	Expand both C445:I1 and C445:O1
	STEP 10 :	Select and drag C445:I1:Data to the "?" in the Input row
	STEP 11:	Select and drag C445:O1:Data to the "?" in the Output row.
]	STEP 12:	Select and drag C445:I1:ConnectionFaulted to the "?" in the Comms_Status row.

The setup of the AOI is now complete.





Let's create a **DINT tag** —

STEP 13: name it Input_Output.

The Boolean within the DINT will be used as logical Push Buttons.

STEP 14:	Add a couple of rung project	s to the
STEP 15:	Enable remote FieldB the C445 by latching	Bus control c the
	C445_Enbl_	Ctl_ Net bi

To ensure that the PLC has control after a power loss, a First Scan bit is used for latching on a power-up condition.

STEP 16:	Add a start, stop and fault logic to
	the program,

STEP 17: Download to the processor

The C445 is ready for operation.



APPENDICES **A, B**



EATON RESOURCE DOWNLOADS LINKS

• Eaton Software Downloads

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm

• EIP Assist Software

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm?litlibtarget=200000000866

• Eaton C445

http://www.eaton.com/Eaton/ProductsServices/Electrical/ ProductsandServices/AutomationandControl/ContactorsStarters/ MotorProtectionRelays/C445/index.htm?wtredirect=www.eaton.com/ c445#tabs-3

• Eaton C440/C441

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support SoftwareDownloads/index.htm?litlibtarget=200000000835

• Eaton PowerXL DA1

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm?litlibtarget=2000000001137

• Eaton PowerXL DG1

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm?litlibtarget=200000000867

• Eaton SVX 9000

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm?litlibtarget=200000000726

• Eaton S811+/S801+ Soft Starter

http://www.eaton.com/Eaton/ProductsServices/Electrical/ ProductsandServices/AutomationandControl/ContactorsStarters/ SoftStartersControllers/S811S801Plus/PCT_377642

http://www.eaton.com/SEAsia/ProductsSolutions/Electrical/ProductsServices/ AutomationControl/SolidStateMotorControl/SoftStarters/S811Series/index. htm#tabs-1

• E-Series Protective Relay

http://www.eaton.com/Eaton/ProductsServices/Electrical/ ProductsandServices/ElectricalDistribution/PowerDistributionComponents/ ProtectiveRelays/MotorRelays/EMR-4000/index.htm

http://www.eaton.com/Eaton/ProductsServices/Electrical/Support/ SoftwareDownloads/index.htm?litlibtarget=200000000987 b



EATON SUPPORTED PRODUCTS AND THEIR RESPECTIVE I/O ASSEMBLIES

 Supported Devices 	• C441R S611 120 VAC	106/131	• C441V S811+ 24 VDC
	105/60	106/133	101/61
Select the product to configure	105/100	C441U C440 120 VAC	101/102
C441R C441 120Vac I/O C441T C441 24Vdc I/O C441T C441 24Vdc I/O C441T S611 120Vac I/O C441T S611 120Vac I/O C441U C440 120Vac I/O C441U S811+ 120Vac I/O C441U S811+ 120Vac I/O C441U S811+ 24Vdc I/O C441U V811+ 24Vdc I/O C441U V0 24Vdc I/O C441V I/O 24Vdc I/O SVX/SPX 9000 9000X OPTCQ PowerXL DG1 Power Xpert C445	105/107 105/108 105/121 105/131 105/133 106/60 106/100	105/60 105/107 105/120 105/130 • C441V C440 24 VDC 105/60	101/110 101/111 101/120 101/121 101/130 101/131 101/140
PowerXL DA1	106/107	105/107	101/141
• C441R C441 120 VAC	106/108	105/120	101/150
105/50 105/51 105/100	106/131 106/133	• C441U S811+ 120 VAC	• C441U I/O 120 VAC 32/3 22/107
105/107 105/110 105/115	• C4411 5611 24 VDC 105/60 105/100 105/107	101/61 101/102 101/110	• C441V I/O 24 VDC 32/3
• C441T C441 24 VDC 105/50	105/107 105/108 105/121	101/111 101/120 101/121	32/107 • SVX/SPX 9000X OPTCC
105/50 105/131 105/51 105/133 105/100 106/60 105/107 106/100 105/110 106/107	101/130 101/131 101/140 101/141 101/150	21/71 23/73 25/76 101/127 111/127	
105/121	106/108 106/121	101/100	111/12/

b



 PowerXL DG1 drive 	 Power Xpert C445 Smart 	104/100
20/70	2/50	104/107
20/71	2/51	104/110
20/73	2/52	104/116
20/107	2/54	104/121
20/117	2/100	105/50
20/127	2/107	105/51
21/70	2/110	105/52
21/71	2/116	105/54
21/73	2/121	105/100
21/107	3/50	105/107
21/117	3/51	105/110
21/127	3/52	105/116
23/70	3/54	105/121
23/71	3/100	106/50
23/73	3/107	106/51
23/107	3/110	106/52
23/117	3/116	106/54
23/127	3/121	106/100
101/70		106/107
101/71	5/51	106/110
101/73	5/52	106/116
101/107	5/54	106/121
101/117	5/100	
101/127	5/107	
111/70	5/110	
111/71	5/116	
111/73	5/121	
111/107	104/50	
111/117	104/51	
111/127	104/52	
	104/54	