

Application Note 3029 Televac EthernetIP Vacuum Controllers Creating and Mapping Class 3 Connections for Rockwell Automation Allen-Bradley CompactLogix PLCs

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1 Description

This document explains the basics of the process for creating and mapping Class 3 Explicit Message connections in the Rockwell Automation Studio 5000 development environment for CompactLogix Programmable Logic Controllers (PLCs). This will allow the PLC to communicate with the connected EthernetIP Televac device to exchange data and set parameters from a remote location. Before setting up a new connection, refer to Televac Application Note 3016 for loading an EDS file into the PLC and adding a new Ethernet module to the project.

Please see the relevant Televac EthernetIP product Instruction Manual for a full description on Class 1 and Class 3 connections, as well as a complete ADI table including data instance, name, array length, access, and description, and for information on configuring the IP Address.

2 Setting up a Class 3 GET Connection

2.1 Verify that the EDS file has been loaded and an Ethernet module has been successfully added to the project.

in cogreen	iouci		
🔺 🚄 I/O Config	guration		
⊿ 📟 5069 B	Jackplane		
	5069-L306ER EIP_test		
▲ 뷰 A1/A2	. Ethernet		
F 50(69-L306ER EIP test		
Eth	hernetIP MX MX_1		
Module Defined	Tags		
MX_1:I	-		
Description			
Status	Running		
Module Fault			

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2.2 Select the rung for the message, right click, and select "Add Ladder Element..." from the drop-down menu.



2.3 Locate the "Input/Output" folder and select "MSG" from the list.

adder Element: MSG		Instruction Help >>
Name	Description	
HH Rung HH Branch HH Branch Level ⊕ Alams ⊕ Bit	(SOR - EOR) (BST - BND) (NXB)	
Timer/Counter		
	Message	
H GSV H SSV	Get System Value Set System Value	_
Show Language Eleme	ents By Groups	ОК
		Cancel
	_	

2.4 Right-click on the box within the MSG element and select "New Tag..." from the menu.

		Get G	as Type for Unit 1
MSG		1180	
Message Control		New Tag	^ Ŧ
	ж	Cut Instruction	Ctrl+)
	Ð	Copy Instruction	Ctrl+0
	â	Paste	Ctrl+V
		Delete Instruction	Delete
		Add Ladder Element	Alt+Inser
		Edit Main Operand Description	Ctrl+D
		Save Instruction Defaults	
		Clear Instruction Defaults	
		Remove Force	
	_	Go To	Ctrl+(

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2.5 Provide a name for the tag, select MESSAGE data type, set the external access based on the ADI in the manual, and select Open MESSAGE Configuration. Once complete, select Create.

Name:	Get_Gas_Type_Unit2		Create
Description:	Get the gas type for unit 2	*	Cancel Help
		-	
Usage:	Local Tag	•	
Туре:	Base Connect	tion	
Alias For:		Ŧ	
Data Type:	MESSAGE]
Parameter Connection:		*	-
Scope:	🔓 Main Program	-	
External Access:	Read/Write	•	
Style:		*	4
Constant	g		
Open MES	SAGE Configuration		

2.6 Select "Get Attribute Single" from the Service Type list. Set Class to "A2" and Attribute to "5". **These values** will be the same for all Televac EthernetIP Class 3 connections. Refer to the appropriate product ADI table located in the User Manual for the Instance. In this example, the Gas Type for Unit 2 for the EthernetIP Gateway is Instance 218. Select "New Tag..." for the Destination Element where the data will be stored locally.

Message Type	Communic	ation Ti IP Gener	ag ic		•]
Service Get	Attribute :	Single		•	Source Element:	(Bytes)
Service e	(Hex)	Class:	A2	(Hex)	Destination	
Instance: 218	A	ttribute:	5	(Hex)	Element:	New Tag
) Enable 🛛	Enable W	aiting	⊖ St	art	O Done	Done Length: 0
) Error Code: rror Path: rror Text:		Extende	ed Error	Code:		Timed Out +

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2.7 Create a new local tag that will store the parameter data. Pressure data is transmitted as a REAL and all other data is transmitted as a STRING. Set the External Access based on the GET/SET information from the ADI in the manual. Once complete, select Create.

			_		
Configura	Name:	gas_type_unit2		Create 🛛 🔻	-
Message	Description:		*	Cancel	
Service Type:				Help	-
Service			-		wtes)
Code: Instance	Usage:	Local Tag	•		-
	Туре:	Base Connection.			
_	Alias For:		-		
	Data Type:	STRING			
- 1	Parameter Connection:		*		
	Scope:	b Main Program	•		
- [External Access:	Read/Write	•		
) Enable	Style:		*		
) Error C	Constant				
Error Path	Sequencin	g			
alor rext.	Open Cont	iguration			

2.8 Select the newly created local tag in the Destination Element box.

Configuratio	n* Commun	ication Ta	ag							
Message	Туре:	CIP Gener	ic	•						
Service Type:	Get Attribut	e Single	•	Source Element: Source Length:	0	- (Bytes)	-	?	N)	sage C
Code:	e (He	X) Class:	A2 (Hex)	Destination Element:	gas_type_	unit2	-	H H H	?>─ └	
Instance:	218	Attribute:	5 (Hex)		T, Enter	Name Filter.	•	Show: All Tag	js	•
					Name		==	Data Type	Description	-
					⊳ ga ⊳ Ga	s_1_str is_Type_Uni	t1	STRING MESSAGE	String for gas Get Gas Type	
					⊳ ga	s_type_unit	2	STRING		
				_	inp M> ou tes	out_dummy (_1:I tput_dummy st_str		BOOL _005A:Freder. BOOL STRING		E
Enable Error Cod Error Path: Error Text:) Enable e:	Waiting Extende	⊖ Start ed Error Code:	O Done D	Dor					
			ОК	Cancel		ontroller tag	5			T

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2.9 Move to the Communication tab and select the Televac Ethernet module. Verify that the name of the module shows up in the Path location.

Configuration'	Communication Tag	
Path:	Bro	wse
Bro	Message Path Browser	×
Commu	Path: MX_1	
	MX_1 	(Octal)
	□	
) Enable	OK Cancel Help	
) Error Code: Error Path: Error Text:	Extended Error Code: Timed O	* 1

2.10 Move to the Tag tab and verify that the tag Name matches the tag that was created in Step 2.5. When finished, select Apply to save the changes and OK to exit the configurator.

coningulation	Communication*	Tag			
Name:	Get_Gas_Type_I	Jnit2]	
Description:	Ge	t the gas type for unit 2	*		
			-		
Type: Data Type: Scope: External Access:	Base MESSAGE 5 Main Program Read/Write				
				Dana Lanatha Q	

2.11 The GET MSG ladder element should now be ready to receive data from the Ethernet module.

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3 Setting up a Class 3 SET Connection

3.1 Verify that the EDS file has been loaded and an Ethernet module has been successfully added to the project.

in Logica in	ouci .			
A 🔜 I/O Config	juration			
⊿ 📼 5069 B	ackplane			
[0]	5069-L306ER EIP_tes	1		
▲ 뫎 A1/A2,	Ethernet			
506	9-L306ER EIP_test			
🖪 Eth	ernetIP MX MX 1			
		1		
Module Defined	Tags			
MX_1:I				
Description				
Status	Running			
Module Fault				

3.2 Create a new STRING type tag in the Controller Tags table. Set the String Length to match the Array Size of the instance being set from the product ADI table. In this example, the array size of the Gas Type from the EthernetIP Gateway is 2 bytes.

lame _== /	Value +	Force Mask	Style	Data Type	Description	Con 2
MX_1:1	{}	{}		_005A:FredericksCom		
test_str		{}		STRING		
◊ test_str.LEN	2		Decimal	DINT		
▶ test_str.DATA	{}	{}	ASCII	SINT[82]		

3.3 Set the String to the desired parameter. In this example, the String is set to "N2" for Nitrogen gas.

📙 MainProgram - Main	nRoutine 🚦 Module Properties: L	ocal (Fredericks Company 1.035) <table-cell> 🗸 Cor</table-cell>	ntroller Tags - EIP_test(co	ontroller) ×		
Scope: Scope: Scope:	✓ Show: All Tags		• T.	Enter Name Filter		
Name	== -	Value • Force Mask	 Style 	Data Type	Description	Con 🔶 🔑
▶ MX_1:I		{}	{}	_005A:FredericksCom		Pro
▶ test_str	String Browser - test_str N2 OK Cancel P 0 Error(s)	Apply Help 2 INS 2 of 82		STRING		verties
↓ Monitor Tags	Edit Tags /			m		

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3.4 Select the rung for the message, right click, and select "Add Ladder Element..." from the drop-down menu.



3.5 Locate the "Input/Output" folder and select "MSG" from the list.

adder Element: MSG		Instruction Help >>
Name	Description	
HH Rung	(SOR - EOR)	
	(BST - BND)	
Branch Level	(NXB)	=
+ Alarms		
E Timer/Counter		
🕂 🔄 Input/Output		
H MSG	Message	
HH GSV	Get System Value	
H SSV	Set System Value	-
Show Language Elem	ents By Groups	ОК
		Cancel

3.6 Right-click on the box within the MSG element and select "New Tag..." from the menu.

	Get Gas	Type for
MSG	Uni	1
Message Control	New Tag	-
¥	Cut Instruction	Ctrl+X
D	Copy Instruction	Ctrl+C
â	Paste	Ctrl+V
	Delete Instruction	Delete
	Add Ladder Element Alt	+Insert
	Edit Main Operand Description	Ctrl+D
	Save Instruction Defaults	
	Clear Instruction Defaults	
	Remove Force	
	Go To	Ctrl+G

A Pravorites Add-on Alarms Dit Inner/Counter Induboutout Compare C

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vatn wove/Louical

3.7 Provide a name for the tag, select MESSAGE data type, set the external access based on the ADI in the manual, and select Open MESSAGE Configuration. Once complete, select Create.

Name:	Set_Gas_Type_Unit2	Create 🗸 🔻	
Description:	Set Gas Type for Unit 2	*	Cancel Help
Usage:	Local Tag	-	
Type:	Base Conne	ction	
Alias For:		-	
Data Type:	MESSAGE		
Parameter Connection:		-	
Scope:	5 Main Program	-	
External Access:	Read/Write	•	
Style:		+	
Constant	g		
Constant	ig		

3.8 Select "Set Attribute Single" from the Service Type list. Set Class to "A2" and Attribute to "5". **These values** will be the same for all Televac EthernetIP Class 3 connections. Refer to the appropriate product ADI table located in the User Manual for the Instance. In this example, the Gas Type for Unit 2 for the EthernetIP Gateway is Instance 218. Set the Source Element and Length to the tag created in step 3.2 that is used for storing the value to send to the module.

Message	Type:	CIP Ge	neric		•		
Service Set Attribute Single		Source Element:	test_str				
Service Code:	10	(Hex) Clas	s: A2	(Hex)	Destination		(0)(00)
Instance	: 218	Attribut	e: 5	(Hex)	Element:	New Tag	
) Enable	() Ena	able Waiting	() S	tart Codo:	O Done [Done Length: 0	

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3.9 Move to the Communication tab and select the Televac Ethernet module. Verify that the name of the module shows up in the Path location.

Configuratio	n* Communication Tag	
Path	Browse	
Bro	Message Path Browser	
Commu (a) CIP	Path: MX_1 MX 1]
CIP Sou	□	(Octal) ection
) Enable	OK Cancel Help	
) Error Cod Error Path: Error Text:	e: Extended Error Code: Timed Out 🔹	

3.10 Move to the Tag tab and verify that the tag Name matches the tag that was created in Step 3.7. When finished, select Apply to save the changes and OK to exit the configurator.

onfiguration	Communication	Tay		-	
Name:	Set_Gas_Type_Ur	nit 2]	
Description:	Se	t Gas Type for Unit 2	~		
			-		
Туре:	Base				
Data Type: Scope: External Access:	MESSAGE La Main Program Read/Write				
) Enable	O Enable Waiting	O Start	O Done	Done Length: 0	
) Error Code: rror Path:	Extend	ed Error Code:		🥅 Timed Out 🕈	

3.11 The SET MSG ladder element should now be ready to send data to the Ethernet module.

4 Contact Us

Please feel free to contact us with any questions:

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