

PLX51-DF1-ENI to communicate a CPX and a PLC5

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This document shows how to set up the required software and hardware in order to migrate from MVI69-DFCM to PLX51-DF1-ENI.



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Hardware requirements

Part #	Rev.	Qty.	Description	Manufacturer
PLX51-DF1-ENI	1.003	1	Gateway DF1 to Ethernet/IP	ProSoft Technology
PLC5/40C	1.5	1	PLC	Rockwell
1769-L35E	20.013	1	Logix Controller	Rockwell
1783-US05T		1	5 ports Switch	Rockwell

Before to start

- User should have basic knowledge on how to program under Logix platform as well as setting up a PLC5.
- User must download and install the PLX50 Configuration Utility Software.



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I. Wiring

Below you can find a diagram to wire DF1 interface.



This is the pinout of the cable to communicate with PLC5.

Cable - 1784-CP10 Connects Workstation to Controller Using Serial Port





Technical Note TN-PLX51DF1ENI_Migration from MVI69-





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II. Configuring PLX51-DF1-ENI in Unscheduled mode

This operation mode allows a Logix PLC to issue Message to the gateway then this routes them to DF1 device.



1. Open configuration software

ProSoft PLX50 Configuration Utility	
File Device Tools Window Help	
1 🖬 🖬 (※ 라 슈) 🕂 🗐 🔟 운 �	
	ľ

2. Go to **File** and select **New** to create a new project.

ProSoft PLX50 Conf					
File	Device	Tools			
°D	New				
-	Open				
×	Close				
	Save				
	Save As				
	Recent	•			
	Exit				
-		_			

3. Right click on <New Project> and choose Add.



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🗢 Pr	oSoft PL	X50 Cor	ifiguratio	n Utility	- <new p<="" th=""></new>
File	Device	Tools	Window	Help	
: *כ	- 1 Ľ	¥ 1]	â 🕂	a 6	₽ ‡
Proje	ct Explor	er			🔺 🗄 🗙
ō	<new pr<="" td=""><td>oject></td><td></td><td></td><td></td></new>	oject>			
Proje	ect Explor	er			▼ ₽ X
	Kew Pr	A Pa	ste		
19		G Im	port		
19		Gs Im ➡ Ad	port d		
Ľ9		G Im	port d		

4. In the Add New Device window select DF1 Router. Click in OK button.

👂 Add New Device 🛛 🔀					
Select Device	: Туре				
Image	Device Name 🔺	Description			
Terr	DF1 Messenger	DF1 Messenger Communication Module			
	DF1 Router	DF1 to Logix Communication Module			
	PLX51-DL-232	Data Logger Module			
1	PLX51-HART-4I	HART 4-Channel Input Communication Module			
	PLX51-HART-40	HART 4-Channel Output Communication Module			
	·				
Ok Cancel					

5. You can see now the **DF1 Router – Configuration** window. In **General** tab select **Unscheduled** in **Operation Mode** section.



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DF1 Router - Configuration	
General Serial - DF1 Bridge (Disabled) DF1 Slave (Disabled) Scheduled (Disabled)	
Instance Name DF1 Router Description IP Address 0 0 0 0 Maior Revision 1 V	
ENIP Retry Limit 5 [0-5] ENIP TimeOut 1000 ms	
Operating Mode O DF1 Slave DF1 Master sends message to PLX51. PLX51 maps DF1 message to Logix tag.	
 Scheduled DF1 Commands are configured in the PLX51. PLX51 acts as a DF1 master and executes commands as defined in the configuration software. 	
Unscheduled Logix message is routed through the PLX51 to target DF1 node Note: DF1 node ID and communication path, is defined in RSLogix.	
Bridge Remote Programming of DF1 PLC's from Ethernet PC's. Remote programming of EtherNet/IP PLC's from DF1 PC's. Communication between DF1 HMI's and EtherNet/IP PLC's	
Ok Apply Cancel	

6. Click on the dotted button is to browse the PLX51 module in the **IP Address** section then you can select the module in the **Target Browser** window. Click on **OK** button.

DF1 Router - Configuration	
General Serial - DF1 Bridge (Disabled) DF1 S	ave (Disabled) Scheduled (Disabled)
Instance Name DF1 Router	
Description	
IP Address 0.0.0	. 0 Major Revision 1
ENIP Retry Limit 5 [0-5]	💠 Target Browser 📃 🗖 🔀
ENIP TimeOut 1000 ms	Done
Operating Mode	🖩 🕴 172.168.1.112 : DF1 Router
O DF1 Slave DF1 Master sen PLX51 maps DF	Is mess
Scheduled DF1 Commands PLX51 acts as a	are cor 📧 — 📓 172.168.1.87 : 1769-L30ER/A LOGIX5330ER DF1 m
O Unscheduled Logix message i Note: DF1 node	routed ID and
Bridge Remote Program Remote program Communication	ming o ming ol etwee
	Ok Cancel

7. Go to the **Serial – DF1** tab and configure the basic serial communication parameter to match with PLC5 Chanel 0 configuration (see section III in this document).



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Protocol	Full Duplex 💙	Node Address 0
BAUD Rate	19200	Enable Duplicate Detection
Parity	None	Enable Store and Forward
Error Detection	BCC	Repeat Delay 5 (x 10 ms)
Embedded Responses	Auto	Nodes to Repeat Nodes
Retry Limit	3 [0-10]	
ACK Timeout	20 [2-60] (x 50 ms)	
Reply Msg Wait	5 [2-60] (x 10 ms)	

8. Now download configuration to the gateway.



With this configuration the module is ready to route message from Ethernet/IP side to DF1 protocol.



III. PLC5 configuration

You should verify the PLC5 configuration in order to make it match with PLX51 configuration, additionally you should take in account what data files are available in PLC.

1. Go online with PLC then you can see the current PLC configuration in **Channel Configuration**, just double click on it. In **Channel 0** tab you can see the DF1 port configuration and our gateway must be match with this.

Edit Channel Properties	X
Channel 0 Channel 1A Channel	iel 1B
Communication Mode System (Point-To-Point) System (Slave) System (Master) User (ASCII)	Remote Mode Change Attention Char, \Dx1b Enable System: S User; U
Serial Port Options	Diagnostic File:0
Baud Rate: 19.2K	Parity: None 💌
Bits Per Char: 8	Error Detect: BCC
Stop Bits: 1]
Control Line: No Handsh	aking 🔽

2. On the left side, in **Data Files** section you can see the data files available to read/write.





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IV. Configuring RSLogix5000 or Studio5000

In this section we are going to set up Message instruction to read from or write to data from/to PLC5.

1. Open your project.



2. Right click on Ethernet network 🗄 🚼 Ethernet and select **New Module**.



3. In the **Select Module Type** window select a **PLX51-DF1-ENI** module if you already have installed the EDS file if not, you can select a **Generic Ethernet Module**.

If you already installed the EDS file you can select the module directly from here.

Selec	t Module Type				
Ca	talog Module Discove	ary Favorites			
	pix5j		Clear Filters		Show Filters 📚
	Catalog Number	Description	Vendor	Category	
	PLX51-DF1-ENI	DF1 Router	Prosoft Technol	Communications	



If you are using RSLogix5000 version 19 or lower, or if you have not installed the EDS file you can select the Generic Ethernet Module.

Module Type og Module Discovery Favo gene	orites Clear Fil	ters		Show Filters 🛛
Catalog Number	Description	Vendor	Category	
ETHERNET-BRIDGE	Generic EtherNet/IP CIP Bridge	Allen-Bradley	Communication	
ETHERNET-MODULE	Generic Ethernet Module	Allen-Bradley	Communication	

In this document we are going to use the first option.

4. Assign a Name and IP Address to the module and click on **OK** button to apply changes and close window.

	New Mod	ule							×
1	General* (Conne	ction	Module Info	Internet Protoco	Port Configuration	ן		
	Туре:		PLX5	I-DF1-ENI DF	1 Router				
	Vendor:		Prosol	it Technology					
	Parent:		en2t						
	Name:		PLX5	1			Ethernet Address		
	Description	n:				~	O Private Network:	192.168.1.	
							IP Address:	172 . 168 . 1 . 112	
							O Host Name:		
						~			
	- Module E	Definiti	ion						
	Revision	n:		1.2					
	Electroni	ic Key	ing:	Compatible M	lodule				
	Connect	tions:		I/O Connecti	on				
						Change			
l									
1	Status: Creati	ing					ОК	Cancel Help	



You can see the module in the Ethernet/IP network.



5. **Prosoft Technology** offers you an exported routine to be imported in the user program, this L5X file contains all the DataTypes needed to configure MSG instructions such as a configured Message instruction as an example. In your project, go to the Program where you would like to import the routine and right click on that to select **Import Routine** option

📄 🤯 MainTa	sk		
🖃 🤐 🕻	Ē.	New Routine	
🔠 Motion G		Import Routine	
Ungr			
🧰 Add-On 🔓	ž	Cut	Ctrl+X
🚞 Data Typ 📑	∎	Сору	Ctrl+C
🔲 Trends 🔄 I/O Conf	2	Paste	Ctrl+V
1756		Delete	Del
		Verify	
		Cross Reference	Ctrl+E
		Browse Logic	Ctrl+L



6. In the **Import Routine** window select the **.L5X** file to import, then click on the **Import** button.

Import Routine							
Look in:	🗀 ProSoft Techr	ology	~	6	1 🖻	•	
My Recent Documents Desktop My Documents	DF1Router.L5X						
My Computer	File name:	DF1Router.L5X			*		Import
	Files of type:	RSLogix 5000 XML Files (*.L5	X)		~		Cancel
My Network	Files containing:	📳 Routine			~		Help
Places	Into:	🕞 MainProgram			*		.:



7. In the **Import Configuration** window click on **OK**. All DataTypes will be created in your project.

	mpor	t Configuration		X
*	×	Find: Find Within: Final Name	<mark>∼</mark> # #	Find/Replace
Imp	ort Co	ntent:		
	- 🚑 (MainTask	Configure Routine	e Properties
	i	MainProgram	Import Name:	DF1Router
			Operation:	Create
		∰ Tags 		O References will be imported as configured in the References folders
1	. 👩	Other Components Frors All amings	Final Name:	DF1Router V Properties
		Enolor Wahingo	Description:	
				v
			Туре:	🗎 Ladder Diagram
			In Program:	🕞 MainProgram
			Number of Runas:	3
<				
Re	ady			

You will be able to see the routine and datatypes imported





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8. Create a new **MSG** instruction with parameters show below.

Message Configuration - DF1_MSG_1	×
Configuration Communication Tag Message Type: CIP Generic Service Custom • Type: • • Service Ga (Hex) Class: Service 6a (Hex) Class: 408 Instance: 1 Attribute: 0 (Hex)	Source Element: DF1_MSG_1_Req Source Length: 360 Destination DF1_MSG_1_Resp Element: New Tag
○ Enable ○ Enable Waiting ○ Start	Done Done Length: 24
O Error Code: Extended Error Code: Error Path: Error Text:	🔲 Timed Out 🗲
ОК	Cancel Apply Help

Tags in **Source Element** and **Destination Element** must be created as show below.

Name		Alias For	Base T	Data Type
				ProSoftDF1RMsgRequest
⊕-DF1_MSG_1_Res	P			ProSoftDF1RMsgResponse



9. In the **Communication** tab fill the **Path** field using **Browse** button Then click on **OK** button to apply changes.

Message Cor	figuration - DF1_MSG_1	23
Configuratio	n Communication Tag	
Pati	n: PLX51 Browse.	.
🔘 Broa	Message Path Browser	
Commun	Path: PLX51	
CIP CIP Sour	□ - 🔄 1/0 Configuration	(Octal)
Cor	□ 1769-L35E MVI69DFCM □ 1769-L35E Ethernet Port LocalENB	ection
⊖ Enable	Ethernet ■ # 1769-L35E Ethernet Port LocalENB ■ PLX51-DF1-ENI PLX51	
 Error Cor Error Path: 	iand CompactBus Local in 111769-MODULE MVI69	-
Error Text:		Help
	OK Cancel Help	



- 10. Using the tag **DF1_MSG_Req** we can configure the command to issue through the Message instruction.
- **DestinationNode**: is the DF1 node.
- **DF1DataFileAddress**: is the first element to read/write.
- **Function**: function to issue.
- **DataType**: data type to read/write.
- ElementCount: number of elements to read/write.
- **RequesData**: data to send with the command when a writing command is being configured.

Name <u>IB</u> A	Value 🔸
⊡ DF1_MSG_1_Req	{}
	1
DF1_MSG_1_Req.DF1DataFileAddress	'N7:10'
DF1_MSG_1_Req.Function	{}
-DF1_MSG_1_Req.Function.PLC5TypedRead	1
-DF1_MSG_1_Req.Function.PLC5TypedWrite	0
-DF1_MSG_1_Req.Function.SLCTypedRead	0
DF1_MSG_1_Req.Function.SLCTypedWrite	0
DF1_MSG_1_Req.DataType	{}
-DF1_MSG_1_Req.DataType.BOOLEAN	0
-DF1_MSG_1_Req.DataType.INT	1
DF1_MSG_1_Req.DataType.REAL	0
DF1_MSG_1_Req.ElementCount	10
DF1_MSG_1_Req.RequestData	{}



V. Communication test

Reading command

After the message instruction is enabled the Done bit (DN) is set if this instruction is executed properly if not, Error bit (ER) is set and you should see what is the error code.



Go to the controller tags then in **DF1_MSG_1_Resp.ResponseData** check if the array has been populated with the values from PLC5.

Name	Value	•
⊡-DF1_MSG_1_Resp		{}
⊕ DF1_MSG_1_Resp.Status		0
		20
DF1_MSG_1_Resp.ResponseData		{}
		66
		655
		1311
		0
		0
		0
		0
		0
DF1_MSG_1_Resp.ResponseData[8]		0
		0

Writing Command

Below you can see how a writing command should be configured to write values from N7:14 to N7:18 in a PLC5 in Node 1. The values to write will be in **DF1_MSG_3_Req.RequestData**



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Name 📰 🛆	Value 🗧 🗲
⊞-DF1_MSG_3	{}
⊡-DF1_MSG_3_Req	{}
	1
DF1_MSG_3_Req.DF1DataFileAddress	'N7:14'
DF1_MSG_3_Req.Function	{}
—DF1_MSG_3_Req.Function.PLC5TypedRead	0
-DF1_MSG_3_Req.Function.PLC5TypedWrite	1
—DF1_MSG_3_Req.Function.SLCTypedRead	0
DF1_MSG_3_Req.Function.SLCTypedWrite	0
DF1_MSG_3_Req.DataType	{}
-DF1_MSG_3_Req.DataType.BOOLEAN	0
-DF1_MSG_3_Req.DataType.INT	1
DF1_MSG_3_Req.DataType.REAL	0
DF1_MSG_3_Req.ElementCount	5
DF1_MSG_3_Req.RequestData	{}
DF1_MSG_3_Req.RequestData[0]	1
DF1_MSG_3_Req.RequestData[1]	2
DF1_MSG_3_Req.RequestData[2]	3
DF1_MSG_3_Req.RequestData[3]	4
DF1_MSG_3_Req.RequestData[4]	5
DF1_MSG_3_Req.RequestData[5]	6

🖀 File N7 ((dec)									
Offset	0	1	2	3	4	5	6	7	8	9
N7:0	8943	0	0	0	0	0	0	0	0	0 🔺
N7:10	32	320	639	0	1	2	3	4	5	0
N7:20	456	562	854	0	0	0	0	0	0	0
N7:30	0	0	0	0	0	0	0	0	0	0
N7:40	0	0	0	0	0	0	0	0	0	0
N7:50	0	0	0	0	0	0	0	0	0	0
N7:60	0	0	0	0	0	0	0	0	0	0
N7:70	0	0	0	0	0	0	0	0	0	0
N7:80	0	0	0	0	0	0	0	0	0	0
N7:90	0	0	0	0	0	0	0	0	0	0
N7:100	0	0	0	0	0	0	0	0	0	•
										<u> </u>
N	7:14							Radi	x: Decima	∎ ∎
Symbol:									Colum	ns: 10 💌
Desc:										
N7 -		Prop	erties		<u>U</u> sag	e		Help	>	



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VI. Migrating from an MVI69-DFCM module as a Master

MVI69-DFCM configuration is done With Prosoft Configuration Builder Software, If you don't have the PCB project, it is possible to upload the configuration from the MVI69-DFCM module.

Open up a new project in ProSot Configuration Builder and add the MVI69-DFCM module to the project.

In the tree view of PCB, click on the 5201-DFNT-DFCM module to select it. On the menu bar, select PROJECT, and then choose Module > Upload from Device to PC.

1. Make sure the PLX51-DF1-ENI is configured as the MVI69-DFCM module is.

MVI69-DFCM

🗄 💑 Module		
🗄 🖧 DF1 Port 1	[DF1 Port 1]	· Yos
🔀 DF1 Port 1	Type	: Master
DF1 Port 1 Comma	Local Station ID	: 129
DF1 Port 1 Comma	Protocol Termination Type	: Full-Duplex
DF1 Port 1 Comma	Baud Rate	: 19200
DF1 Port 1 Comma	Parity	: None
DF1 Port 1 Comma	Data Bits	1
DF1 Port 1 OVERRI	Minimum Response Delay	: 3
⊕ 💑 DF1 Port 2	RTS On	: 5
∓s Comment	Use CTS Line	: 0 : NO
	Response Timeout	: 1000
	Retry Count	: 3
	I FNO DELAV	1 1

The MVI69-DFCM module is configured under these parameters:

- **Enabled**: enable the serial port to communicate.
- **Type**: it configures the port to works as a Master or Slave.
- StationID: node configured to this port.
- **Protocol**: '0' for Full Duplex and '1' for Half Duplex.
- **TerminationType**: '0' for BCC and '1' for CRC.
- **Baudrate**: network baud rate.
- **Parity**: parity on the serial network.
- DataBits: Data bits on the serial network.
- StopBits: Stop bits on the serial network.



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PLX51-DF1-ENI

Configure these parameters as follow.

PLX51-DF1-ENI	MVI69-DFCM
Protocol	Protocol
BAUD Rate	Baudrate
Parity	Parity
Error Detection	TerminationType

- **Protocol**: Full Duplex
- BAUD Rate: 19200
- Parity: None
- Error Detection: BCC

💠 DF1 Router - Configura	ition	
General Serial - DF1 Bridge	(Disabled) DF1 Slave (Disabled)	Scheduled (Disabled)
Protocol	Full Duplex	Node Address 0
BAUD Rate	19200	Enable Duplicate Detection
Parity	None	Enable Store and Forward
Error Detection	BCC	Repeat Delay 5 (x 10 ms)
Embedded Responses	Auto	Nodes to Repeat Nodes
Retry Limit	3 [0-10]	
ACK Timeout	20 [2-60] (x 50 ms)	
Reply Msg Wait	5 [2-60] (x 10 ms)	
	Ok	Apply Cancel

2. Configure the Message instruction, considering the configuration of each command in the MVI69-DFCM module.



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MVI69-DCFM

 MVI69-DFCM → → Module → → Module → → DF1 Port1 → □ DF1 Port1 → □ DF1 Port1 Commands SLC500 2 Address Fields → □ DF1 Port1 Commands PLC5 Binary → □ DF1 Port1 Commands PLC5 Binary → □ DF1 Port1 Commands PLC5 ASCII 	Edit - DF1 Port 1 Commands	al Address Poll Interval Reg Count 1 10	Swap Code N No Change 1	
I DF1 Port 1 Commands Basic I DF1 Port 1 OVERRIDE DATA FILE MAPS 과 & DF1 Port 2 교 & Comment	Enable Internal Address Poll Interval Reg Count Swap Code Node Address Func Code File Number Element Number Sub Element Comment	Enabled 0 1 10 No Change 1 Word Range Read 7 10 0	Enable Enabled Definition:	•

- Enable: enable the command.
- Internal Address: where data is stored for read commands and source of data for write commands.
- **Poll Interval**: minimum number of seconds between commands.
- **Reg Count**: number of registers to read or write.
- Swap Code: allows to swap data.
- Node Address: address of device to issue this command.
- Func Code: function code to execute.
- File Number: this is the File number.
- Element Number: this is the File element.

PLX51-DF1-ENI

Configure module as follow.

PLX51-DF1-ENI	MVI69-DFCM
DestinationNode	Node
DataFileAddress	Parameter_1:Parameter_2
Function	Func
DataType	-
ElementCount	Count

- **DestinationNode**: 1
- DataFileAddress: N7:10
- **Function**: PLC5TypedRead = 1
- DataType: INT = 1
- ElementCount: 10



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Name == △	Value 🗧 🗧
DF1_MSG_1_Req.DestinationNode	1
DF1_MSG_1_Req.DF1DataFileAddress	'N7:10'
DF1_MSG_1_Req.Function	{}
-DF1_MSG_1_Req.Function.PLC5TypedRead	1
-DF1_MSG_1_Req.Function.PLC5TypedWrite	0
—DF1_MSG_1_Req.Function.SLCTypedRead	0
DF1_MSG_1_Req.Function.SLCTypedWrite	0
DF1_MSG_1_Req.DataType	{}
-DF1_MSG_1_Req.DataType.BOOLEAN	0
-DF1_MSG_1_Req.DataType.INT	1
DF1_MSG_1_Req.DataType.REAL	0
	10

Note: the poll interval will depend on how often the Message instruction is going to enable.

Functions supported by the MVI69-DFCM module

5.3.2 PLC-5 Command Set Functions

Function Code	Command	Function	Definition	PLC5	SLC500 & MicroLogix	Power- monitor II	ControlLogix
100	0x0F	0x00	Word Range Write (Binary Address)	Х			Х
101	0x0F	0x01	Word Range Read (Binary Address)	Х			х

5.3.3 SLC-500 Command Set Functions

Function Code	Command	Function	Definition	PLC5	SLC500 & MicroLogix	Power- monitor II	ControlLogix
501	0x0F	0xA1	Protected Typed Logical Read With Two Address Fields		X		X
502	0x0F	0XA2	Protected Typed Logical Read With Three Address Fields		Х	X	X
509	0x0F	0XA9	Protected Typed Logical Write With Two Address Fields		Х		X
510	0x0F	0XAA	Protected Typed Logical Write With Three Address Fields		Х	Х	X
511	0x0F	0XAB	Protected Typed Logical Write With Mask (Three Address Fields)		Х		X



VII. Configuring PLX51-DF1-ENI in Scheduled mode

This option allow to configure DF1 commands in the gateway so it is not necessary programming any new lines in any PLC.

1. Go to the configuration utility and open the gateway configuration, set the **Scheduled** mode.

💠 DF1 Router - Configura	tion	
General Serial - DF1 Bridge	(Disabled) DF1 Slave (Disabled) Scheduled	
Instance Name DF1 Ro	buter	
Description		
IP Address 172	. 168 . 1 . 112 Major Revision 1 💌	
ENIP Retry Limit 5	[0-5]	
ENIP TimeOut 10	00 ms	
Operating Mode		
O DF1 Slave	DF1 Master sends message to PLX51. PLX51 maps DF1 message to Logix tag.	
Scheduled	DF1 Commands are configured in the PLX51. PLX51 acts as a DF1 master and executes commands as defined in the configuration software.	
	Logix message is routed through the PLX51 to target DF1 node Note: DF1 node ID and communication path, is defined in RSLogix.	
O Bridge	Remote Programming of DF1 PLC's from Ethernet PC's. Remote programming of EtherNet/IP PLC's from DF1 PC's. Communication between DF1 HMI's and EtherNet/IP PLC's	
	Ok Apply Cancel	

2. In the **Scheduled** tap you need to configure the path to the logix controller using the **Browser** button. Assign a name in **Logix Name** field.

In the Logix Tag Mapping you have up to 20 commands to write to or read from a DF1 device. Parameters to configure are described below.

- Logix Function: Read or Write.
- Scan: This is the poll interval configured in Scan Configuration section.
- **Device Type**: Define if the command to execute will be PLC5 Typed or SLC Typed.
- **DF1 Node**: Node assigned to the DF1 device.
- Data Address: Data File to read/write.
- Element Count: Number or register to read/write.
- Target Name: Select a defined Logix PLC in Logix Controller Mapping section.
- **Target Tag**: Tag array in controller tags where read data will be placed or written data will be taken to issue to.



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DF1	Router	Cor	nfigur	atio	n									
àener	al Serial ·	DF1	Bridg	e (Di	sabled) [DF1 9	Slave (Di	isabl	ed) Scheduled					
Logia	x Controller	Мар	ping (m	ax. ol	f 8 items.)							Scan C	onfiguration	
Logix Name Logix Controller Path						Brows	se	Scar	n Interval (m	s)				
۲.	CLX_PLX51 172.168.1.32,1,0							A	1000					
*	*						В	2000						
												С	5000	
												D	10000	
Logi	х Тад Мар	ping ((max. of	20 it	ems.)									
	Logix Functio	n	Sca	n	Device DF1 Data Type Node Address		Data Address	Element Targe Count Name		et e	Target Tag	Browse		
	Read	~	В	*	PLC5	۷	1	~	N7:10	5	CLX_PL	X51 💌	N7	
	Read	~	В	*	PLC5	۷	1	¥	F9:0	5	CLX_PL	X51 💌	F9	
▶*		~		¥		¥		~				~		
						_		_			_			
							Ok		Apply	Cance	el			

In Controller tags these are the tags created.

	REAL[100]
	INT[100]

Click on **OK** button to accept the changes. Then Download the new configuration.

3. Check if data is received properly in the Logix controller.

Name 💷 🛆	Value 🔸	Name 😑 🛆 '	Value 🗧 🗲
⊡-N7	{}	F9	{}
±-N7[0]	38	F9[0]	84.86667
±-N7[1]	378	-F9[1]	50.92
	756	-F9[2]	127.3
	0	F9[3]	0.0
±-N7[4]	1	-F9[4]	0.0



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VIII. Configuring in DF1 Slave mode

This allow to connect a PLC5 or any other DF1 Master to a Logix PLC working as a server.

1. Set the operation mode to **DF1 Slave**.

DF1 Router - Configuration	
General Serial - DF1 Bridge (Disabled) DF1 Slave Scheduled (Disabled)	
Instance Name DF1 Router	
Description	
IP Address 172 . 168 . 1 . 112 Major Revision 1 💌	
ENIP Retry Limit 5 [0-5]	
ENIP TimeOut 1000 ms	
Operating Mode	
OF1 Slave DF1 Master sends message to PLX51. PLX51 maps DF1 message to Logix tag.	
O Scheduled DF1 Commands are configured in the PLX51. PLX51 acts as a DF1 master and executes commands as defined in the configuration soft	ware.
Unscheduled Logix message is routed through the PLX51 to target DF1 node Note: DF1 node ID and communication path, is defined in RSLogix.	
Bridge Remote Programming of DF1 PLC's from Ethernet PC's. Remote programming of EtherNet/IP PLC's from DF1 PC's. Communication between DF1 HMI's and EtherNet/IP PLC's	
Ok Apply Cancel	

2. Go to the DF1 Slave tab, then configure the path to the logix controller in Logix Controller Mapping and assign a name to this map. In Logix Tag Mapping configure a DF1 Node and Data File that will be emulated in DF1 side, then select the Logix PLC in Target Name and finally write or browse the array tag placed in Controller tags in Target Tag field.



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neral Logix (Serial - DF1 Bridg Controller Mapping (n Target Name	e (Disabled) DF1 S nax. of 8 items.)	Slave Scheduled (Disabled) Logix Contri	sller Path	Browse
► *	CLX_SLAVE	172.168.	1.32,1,0		
Logix	Tag Mapping (max. o DF1 Node	of 20 items.) Data File	Target Name	Target Tag	Browse
	2 💌	N15	CLX_SLAVE	Array_Slave	
*	*				

Array tag in Logix controller.

Name	그림 스	Value 🗧 🗲
-Array_Slave		{}
+ Array_Slave[0]		1
+ Array_Slave[1]		2
+ Array_Slave[2]		3
+ Array_Slave[3]		4
+ Array_Slave[4]		0
+ Array_Slave[5]		0
+ Array_Slave[6]		0
+ Array_Slave[7]		0
+ Array_Slave[8]		0
+ Array_Slave[9]		0
+ Array_Slave[10]		0
+ Array_Slave[11]		0
+ Array_Slave[12]		0
+ Array_Slave[13]		0
+ Array_Slave[14]		0
+ Array_Slave[15]		0
+ Array_Slave[16]		0



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3. In the PLC5 a Message instruction must be configured to read/write data file N15 in DF1 Node 2 and store those values in N7:50 in PLC Data Files.

🞽 MSG - MG12:0 : (1 Elements)	
General This PLC-5 Communication Command : <u>SLC Typed Logical Read</u> Data Table Address : <u>N7:50</u> Size in Elements : <u>5</u> Port Number: <u>0</u> Target Device Data Table Address: <u>N15:0</u> Local Station Address (oct): <u>2</u> (dec): <u>2</u> Local / Remote : <u>Local</u>	Control Bits Ignore if timed out (TO): 0 To be retried (NR): 0 Awaiting Execution (EW): 0 Continuous Run (CO): 0 Error (ER): 0 Message done (DN): 1 Message Transmitting (ST): 0 Message Enabled (EN): 0
Error Description No errors	



DFCM-1907

IX. Migrating from MVI69-DFCM configured as Slave

1. PLX51-DF1-ENI should be configured from the MVI69-DFCM module's configuration.

MVI69-DFCM



The MVI69-DFCM module is configured under these parameters:

- **Enabled**: enable the serial port to communicate.
- **Type**: it configures the port to works as a Master or Slave.
- StationID: node configured to this port.
- **Protocol**: Full Duplex or Half Duplex.
- TerminationType: BCC or CRC.
- Baudrate: network baud rate.
- **Parity**: parity on the serial network.
- DataBits: Data bits on the serial network.
- StopBits: Stop bits on the serial network.
- FirstFile: first file to emulate.
- FileSize: size of each file to emulate.
- FileOffset: Register offset into database where file emulation starts.



DFCM-1907

PLX51-DF1-ENI

Configure these parameters as follow.

PLX51-DF1-ENI	MVI69-DFCM				
Protocol	Protocol				
BAUD Rate	Baudrate				
Parity	Parity				
Error Detection	TerminationType				

- **Protocol**: Full Duplex
- BAUD Rate: 19200
- Parity: None
- Error Detection: BCC

🚸 DF1 Router - Configur	ration	×
General Serial - DF1 Bridg	ge (Disabled) DF1 Slave Scheduled (Disabled)	
Protocol	Full Duplex Node Address	
BAUD Rate	19200 Enable Duplicate Detection	
Parity	None Enable Store and Forward	
Error Detection	BCC Repeat Delay 5 (x 10 ms)	
Embedded Responses	Nodes to Repeat Nodes	
Retry Limit	3 [0-10]	
ACK Timeout	20 [2-60] (x 50 ms)	
Reply Msg Wait	5 [2-60] (x 10 ms)	
	Ok Apply Cancel	
<		>



DFCM-1907

PLX51-DF1-ENI	MVI69-DFCM
Target Name	-
Logix Controller Path	-
DF1 Node	StationID
DataFile	FirstFile
TargetName	-
TargetTag	It seems to FileOffset

- Target Name: CLX_SLAVE.
- Logix Controller Path: 172.168.1.32,1,0
- **DF1 Node**: 2
- Data File: N15
- Target Name: CLX_SLAVE
- **Target Tag**: Array_Slave (Array in controller tags)

¢	DF1 F	Router - Configur	ation								
1	Genera	I Serial - DF1 Bridg	je (Disabled) DF1	Slave Scheduled (Disabled)							
	Logix Controller Mapping (max. of 8 items.)										
	Target Name Logix Controller Path Browse										
	•	CLX_SLAVE	172.168.	1.32,1,0							
	*										
	Logi	ix Tao Manning (max	of 20 items)								
		DF1 Node	Data File	Target Name	Target Tag	Browse					
	•	2 🔽	N15	CLX_SLAVE	Array_Slave						
	*	~		~							
		· · · · · ·									
-			_								
				Ok Apply	Cancel						
<						>					

Note that in both cases the modules are mapping the Data File N15, so the PLC5 is going to write to or read from it.

2. Testing configuration.

Message instruction is configured in PLC5 as show below, in order to read from N15:0 and to store values in N7:50.

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DFCM-1907

🖀 MSG - MG12:0 : (1 Elements)	
General This PLC-5 Communication Command : SLC Typed Logical Read Data Table Address : N7:50 Size in Elements : 5 Port Number: 0 Target Device Data Table Address: Data Table Address: N15:0 Local Station Address (oct): 2 Local / Remote : Local	Control Bits Ignore if timed out (TO); 0 To be retried (NR); 0 Awaiting Execution (EW); 0 Continuous Run (CO); 0 Error (ER); 0 Message done (DN); 1 Message Transmitting (ST); 0 Message Enabled (EN); 0 Error Error Code(Hex); 0
Error Description No errors	

MVI69-DFCM

These are data read by PLC5.

Name	Value 🔶	Force Mask 🔶 🗲	Style
- DFCM.WriteData	()	{}	Decimal
DFCM.WriteData[0]	896		Decimal
DFCM.WriteData[1]	691		Decimal
	582		Decimal
	462		Decimal
⊕ DFCM.WriteData[4]	0		Decimal
⊕ DFCM.WriteData[5]	0		Decimal
DFCM.WriteData[6]	0		Decimal
	0		Decimal
	0		Decimal
DFCM.WriteData[9]	0		Decimal
E DECM WriteD at a[10]	0		Decimal



DFCM-1907

Data are store from the N7:50.

🗃 File Nž	7 (dec)										
Offset		0	1	2	3	4	5	6	7	8	9
N7:0		0	0	0	0	0	0	0	0	0	0
N7:10	9	3	926	1852	0	0	0	0	0	0	0
N7:20		0	0	0	0	0	0	0	0	0	0
N7:30		0	0	0	0	0	0	0	0	0	0
N7:40		0	0	0	0	0	0	0	0	0	0
N7:50	89	6	691	582	462	0	0	0	0	0	0
N7:60		0	0	0	0	0	0	0	0	0	0
N7:70		0	0	0	0	0	0	0	0	0	0
N7:80		0	0	0	0	0	0	0	0	0	0
N7:90		0	0	0	0	0	0	0	0	0	0
•) –
	N7:0								Radi	x: Decima	al 💌
Symbol:										Colum	ns: 10 💌
Desc:											
N7 .	N7 - Properties Usage Help										

PLX51-DF1-ENI

These are data read by PLC5 from the Array_Slave array.

Name 📰 🛆	Value 🔷 🗲
-Array_Slave	{}
+-Array_Slave[0]	14526
+-Array_Slave[1]	9542
+ Array_Slave[2]	21856
+-Array_Slave[3]	95
+ Array_Slave[4]	0
+-Array_Slave[5]	0
+-Array_Slave[6]	0



Data is stored properly from N7:50 though N7:54.

🔁 File N7 (dec)										
Offset	0	1	2	3	4	5	6	7	8	9
N7:0	0	0	0	0	0	0	0	0	0	0
N7:10	94	940	1879	0	0	0	0	0	0	0
N7:20	0	0	0	0	0	0	0	0	0	0
N7:30	0	0	0	0	0	0	0	0	0	0
N7:40	0	0	0	0	0	0	0	0	0	0
N7:50	14526	9542	21856	95	0	0	0	0	0	0
N7:60	0	0	0	0	0	0	0	0	0	0
N7:70	0	0	0	0	0	0	0	0	0	0
N7:80	0	0	0	0	0	0	0	0	0	0
N7:90	0	0	0	0	0	0	0	0	0	0
•										<u> </u>
1	N7:0							Radi	x: Decima	al 💌
Symbol:									Colum	ns: 10 💌
Desc:										
N7 :	N7 - Properties Usage Help									



X. Conclusions

The PLX51-DF1-ENI module allows a Logix Controller to communicate with a DF1 PLC using three different operating mode.

If possible to performance changes in logix program it is a good option to implement the Unscheduled operating mode, so user can configure Message instructions to read or write.

The Scheduled operating mode is recommended when user cannot performance any important change in logix program. In some cases will be necessary to create new tags in controller tags.

When there is a PLC working as a DF1 Master, the gateway should work in DF1 Slave mode so message instructions will be configured in DF1 PLC.