## Molex Ethernet/IP Tool getting data from SLC504 and PLC5 Using EQ7000-EDH+ on DH+ network

Setup for this application note, consisted of a SLC/504 and a PLC5 on a DH+ network with Equustek EQ7000-EDH+ and a PC with RSLINX and RSLOGIX 500 as well as Molex Ethernet IP Tool on Allen Bradley Ethernet and Ethernet IP side of the EQ7000.



This application note includes configuring the EQ7000-EDH+ using Equustek EQ32 configuration software, going online using Allen Bradley RSLINX, RSLOGIX 5 to show that data read from PLC5 & SLC504 in both the RSLINX and the Molex Ethernet IP are same.

Power on the EQ7000 and connect it to the PC using the USB cable then open Device Manager. In Device Manager under Ports (COM & LPT) find out the USB Serial Port, in our case here is COM3. Press the configure push button switch on the right-hand side of the EQ7000 to put it in offline configuration mode (Make sure the MOD STATUS LED is flashing green). Start EQ32 software, under products, select EQ7000.



From the drop Menu of the COM Port Selection, select the USB comport previously found under the Device Manager. Click on Offline Manager to confirm that you can communicate with the unit.

🌮 EQ7000 Main Menu	×	🌮 EQ7000 Main Menu	×
Equustek socurrows mc	EQ32 Configuration Software	Equustek sourtone me	EQ32 Configuration Software
EQ7000 Main Menu	COM Port Selection None	EQ7000 Main Menu	COM Port Selection COM3 -
Configure Device Information Offline Manager	None Cont Cont Cont Cont Cont Select the COM Port tha Cont used to communicate w <del>CONT</del> EQ7000.	Configure Device Information Offline Manager	Select the COM Port that will be used to communicate with the EQ7000.
	Return to Product Selection	Re	turn to Product Selection

Seeing the offline manager menu confirms that your USB connection is OK, click on Close. Click on Configure.





From the Drop Menu of Node Address select a node address for the EQ7000, any node address that doesn't exist. Select the DH+ Baud rate of the Data Highway Plus network (Network Speed), then click on Next



Type the IP address for the EQ7000 then the Subnet Mask and the Default Gateway and click on Next.

Configure Online Parameters	×	Configure Online Parameters	×
Equustek	Data Highway Communication Settings	Equustek.	Ethernet Communication Settings
EQ32 Configuration	Network Type	EQ32 Configuration Software	DHCP Disabled •
EQ7000		EQ7000	IP Address 192 168,2 50 Subnet Mask 255, 255, 0
Welcome Screen Welcome / Open Configuration	Node Address	Welcome Screen Welcome / Open Configuration	Default Gateway [192.168.2.1]
Communication Parameters Drift Humbury Kellings Ethernet Settings		Communication Parameters Data Highway Settings Thread Settings	Speed Auto Datect  Socket Timeout  30 s
Finalize Settings Apply Settings		Finalize Settings Apply Settings	
	Upload Settings Back Cancel		Upload Settings Back Next Cancel

Select Download Configuration and click on Finish. Warning message will ask to press the configure push button, you don't need to, since it was done earlier, just click on OK Once you see the Success message click on OK.

	X		
<ul> <li>Configure Online Parameters</li> <li>EQ.32 Configuration</li> <li>EQ.7000</li> <li>Welcome Screen Welcome / Open Configuration</li> <li>Communication Parameters Data Highway Settings Ethemet Settings</li> <li>Finalize Settings Approximatings</li> </ul>	Apply Configuration Settings     To deveload the configuration setlings to the potency device, setect the Deveload     Configuration and lock the Hild Holdin, Your advice serve you     configuration and lock the Hild Holdin, Your advices a set of the other options available.     Overfload Configuration     Download and Serve Configuration     Seve Configuration	EQ12 Success!	K     Fress the Configure button on the EQ7000 before continuing.     The LED's on the left should have the following pattern:     Net Status: Off     DH Metwork: Off     Mod Status: Flashing Green     OK
		0	Configuration has been downloaded to the EQ7000
	Upload Settings Back Finish Cancel		OK

In case you encounter any error message, press the RESET push button switch on left hand side of the EQ7000 then press the Configure push button switch on the right-hand side of EQ7000 and click on Finish again in EQ32.

After Success configuring the unit, click on Exit to close the EQ32 software and press the Reset push button switch on the EQ7000 to put it in online operating mode.



Start RSLINX and click on Configure Drivers icon

🗞 RSLinx Classi	c Lite - [RSWho	- 1]			
🗟 <u>File</u> View	<u>Communication</u>	ons <u>S</u> tation	DDE/OPC	Sec <u>u</u> rity <u>W</u> indow	/ <u>H</u> elp
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Autobrowse	Refresh	ta º. III	Not Browsing		
□ · 馬 Workstati	on, LAB-D-PC Gateways, Ether	net		ः क्षे	묾
▣ <mark>器</mark> AB_ET ▣ <mark>器</mark> AB_ET	H <mark>-1, Ethernet</mark> HIP-1, Ethernet		Linx Gatew	a AB_ETH-1 a Ethernet	AB_ETHIP-1 Ethernet

Select Ethernet Devices Driver from the drop menu of Available Driver Types. And click on Add New.

Configure Drivers	?	? ×	Configure Drivers	? ×
Available Driver Types 1784-U2DHP for DH+ devices B 5222 DH doubles C Ethernet devices	Add New	<u>C</u> lose <u>H</u> elp	Available Driver Types:	<u>C</u> lose <u>H</u> elp
EnterNet/IP Unver 1784-PKTQI/PCMK for DH+/DH-485 devices DFI Polling Master Driver 1784-PCICS) for Controllet devices DFI Stave Driver DH455 UIC devices Virtual Backplane (SoftLogix58x, USB) DeviceNet Drivers (1770-KP, SDNPT drivers) SLC 500 (DH495) Emulator driver SmaftGuad USB Driver Remote Devices via Linx Gateway	Status Co Running Co Running S	Startup Start Stop Delete	Name and Description         Status           AB_ETH-1_A-B Ethernet RUNNING         Running           AB_ETHIP-1_A-B Ethernet RUNNING         Running	Configure Startup Start Stop Delete

Type a name for the driver and click Ok.

Add New RSLinx Classic Driver	×
Choose a name for the new driver. (15 characters maximum)	ОК
EQ7000	Cancel

To map all the PLCs that you need to communicate with, type the Node address numbers of the SLC504 & PLC5 under Station in decimal and the IP address of the EQ7000 under the Host name, as for Driver enter the node address number of the EQ7000 under Station. Click on Apply, please map only the PLCs that you want to communicate with, then click Apply, OK then Click on close.

Intion	Liest Name				
lation	Host Name	Add <u>N</u> ew	Available Driver Types:		Close
7	192 168 2 50	<u>D</u> elete	Ethernet devices	✓ <u>Add New</u>	
3	192.168.2.50				Help
	Driver		Configured Drivers:		T
			Name and Description	Status	
			AB_ETH-1 A-B Ethernet RUNNING	Running	Configure
			AB_ETHIP-1 A-B Ethernet RUNNING	Running	
			EQ7000 A-B Ethemet Honning	hunning	Startup
					<u>S</u> tart
					Stop
					Delete

Open RSWHO in RSLINX, right click on the driver that was created and click on Properties. Click on Advanced Browse settings tab and check mark Force network type to

			EQ7000 Properties	? ×
RSLinx Classic Lite - [RSWho - 1]	/OPC Security Window	Help	Browse Addresses Advanced Browse Set	tings
Image: Second secon	Linx AB_ETH-1 Gatewa Ethernet	AB_ETHIP-1 Ethernet Ethern	Poll timeout I Poll tate for known stations Poll rate for known stations Maximum concurrent packets nd OK Cancel	imsec): 3000 imsec): 22000 to this stwork: 32 Reset

Select DH+ from the drop menu, Click on Apply then on Ok.

browse Addresses Addresses			Browse Addresses Advanced Browse	Settings		
I Eorce network type to:	Direct serial connection Direct serial connection Data Highway Plus DH-485	to device 💌	Force network type to:	ta Highway	Plus	
- Tuning	ControlNet DF1 (master or slave) ControlLogix backplane		- Tuning			
Po	I timeout (msec): 3000		Poll times	out (msec):	3000	_
Poll rate for known	stations (msec): 2000		Poll rate for known statio	ns (msec):	2000	-
Maximum concurren	t packets to this network: 32		Maximum concurrent pac	kets to this network:	32	
		Reset			Reset	
100						

In RSLinx RSWho click on the driver that was created to browse the DH+ network.

Here you can see SLC504, and the PLC5, those that we mapped when we created the Ethernet driver.



Right click on SLC504 and click on Data Monitor then double click on integer file N7.

Data	i lable Monito	R LAB-D-P														
File	Туре	Elements	Length	^												
S2	Status	164	328													
B3	Binary	100	200		1											
<b>T</b> 4	Timer	1	6		THE SEC. SI	TM (All Dates	Elle MT							1.000		52
C5	Counter	4	24		THE DEVENUE	nu (u): ciara	EUG 147							1.00		~~~
R6	Control	1	6	-		1 0 1	4	2	3	4	5	6	7	8	0	à III
N7	Integer	256	512				- S	٤.		7	2		- 1			
F8	Float	10	40		N7:0	1998	3996	5994	0	0	0	0	0	0	0	
N9	Integer	14	28		117.40	1000	2420	2400	0	0				0	-	S 1
N10	Integer	100	200		N7:10	1060	2120	3180	U	0	U	U	U	0	U	
F11	Float	10	40		N7:20	0	0	0	0	0	0	0	0	0	0	
B12	Binary	100	200		117.00			0	0000	0		0054		0		
N13	Integer	50	100		N7:30	0	U	U	3333	0	U	0054	U	0	U	
N14	Integer	200	400		N7:40	0	0	0	0	0	0	0	0	0	0	
N15	Integer	100	200		117.50				0							
N25	Integer	50	100		N7:50	0	U	0	U	0	U	0	0	0	U	
N26	Integer	30	60		12010 0100											
F29	Float	100	400	~	Status: Ac	tive										
Found 3	30 of 30				1											

Similarly, right click on PLC5 and click on Data Monitor then double click on integer file N7.

	0	1	2	3	4	5	6	7	8	9
N7:0	850	1700	2550	850	850	850	850	850	850	850
N7:10	850	850	850	850	850	850	850	850	850	850
N7:20	850	850	850	850	850	850	850	850	850	850
N7:30	0	0	0	0	0	0	0	0	0	0
N7:40	0	0	0	0	0	0	0	0	0	0

Now to show that we can request same data files from those PLCs using Molex Ethernet IP Tool we need to open Molex Ethernet/IP Tool and enter EQ7000 IP address, select UCMM under Communications.

: 192.168.2.	50	ommunications	O Connec	cted		ed_send Op	otions	About	Tabs	m	olex
:								View Log		one comp	any > a world of innovat
	0x310 IO-Link				0x305 Sample A	Application			0x306 Copy IC	0 Object	
t Identity	Explicite Message	e Class	0x01 I	dentity	0x06 Conne	ction Manager	0x47 DLR	0x48 QoS	0xF5 TCP/IP		0xF6 Ethernet Link
Broadcast  Network E	: Proadcast										

Click on Explicit Message tab, that will bring (Data, Request and Response windows) to show.



From the Drop Menu of Service select Custome Service.



Enter Service 76 which is 4C in Hex and Class 67 Instance 1 then the HEX value for the main request will show in Request window.

ation :	192.1	68.2.	50		]	Com O L	munic JCMM	ation	s		00	onneo	ted		0	Unco	onnec	ted_s	end		Optio	ıs				Ab	out		Tabs	P	h	m	10	1	ex
atus :																										Viev	v Log				or	ne con	mpan	ysav	orld of inn
			0x3	10 IO	-Link										0x3	05 S	ample	Appl	icatio	1								0	x306	Copy	100	Objec	ct		
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l	_	-	Instar	nce P	1	J							l	4	ю 0	2 2	20 6	7 2	4 0	J			^	0	1	2	3	4	5	6	7	8	9	10	^
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	Data	(hex) 1 0 1 2	2	3	4 5	6	7	8	9	10	^	X												2 3 4 5 6 7 8											
	Data	(hex) 1 2 3	2	3	4 5	6	7	8	9	10	^	X											~	2 3 4 5 6 7 8 9											
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Here we need to enter the data in Hex in Data windows, to read data from the SLC504, then click on Send Request, those data bytes entered will be explained later in details.



After we click Send Request, we get the response as shown in Response window below.



Comparing the response data with those read from RSLINX we can see that they are exact same, for example 07CE= 1998, 0F9C=3996,176A=5994 and so on.

Now to explain the data sent in the request window:

Destination Link(Lower)=00, Destination Link (upper)=00 Destination Node= 03 which is our SLC504 node address number, 0=00, Source Link (lower)=00, Source Link (upper)=00, Source Node=00, 0=00,Command= 0F, Status=00, Transaction Code (upper)=00, Transaction Code ( Lower)=01, Function Code=A2, Data Size = 20, File number=07, File Type=89 for Integer file, Element Number=00, Sub Element Number=00, for more details on all these bytes, please refer to Ethernet IP Protocol and Allen Bradley DF1 protocol (DF1 Command 0F Function A2 is Protected Typed Logical read, Reference page 7-17 of the AB DF1 manual).

CMD	FNC	Byte	File	File	Ele.	S/Ele.
0F S	A2	Size	No.	Туре	No.	No.

The reason we had the Destination link 0 and the Source link 0 as well is that the EQ7000 does not have the back plane and DH+ module that the Control Logix does.

SLC504 also does support Typed Read command (CMD 0F and function 68) Reference page 7-28 of AB DF1 Manual

CMD OF STS	TNS	FNC 68	Packet Offset	Total Trans	PLC-5 sys. address	Size
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To read the same data from SLC504 integer file 7, we need to change the command function and the system address and the elements size, here we get the same data seen in RSLINX or the previous command.



## Then for PLC5 all what we need to do is change the node address to 07 using the same command 0F and function 68 (Typed Read command)



Here we can see that we are getting exact same data we found in RSLINX or RSLOGIX 5.

Comparing the response data with those read from RSLINX we can see that they are exact same, for example 0352=850, 06A4=1700,09F6=2550 and so on.

	0	1	2	3	4	5	6	7	8	9
N7:0	850	1700	2550	850	850	850	850	850	850	850
N7:10	850	850	850	850	850	850	850	850	850	850
N7:20	850	850	850	850	850	850	850	850	850	850
N7:30	0	0	0	0	0	0	0	0	0	0
N7:40	0	0	0	0	0	0	0	0	0	0

Start RSLogix5, then from under Comms click on System comms...

FFLINE	Who Active Go Online	H T BEBE <> 40-40-
o Edits	Go Online	
iver: AB_D	Online Now	User & Bit & Timer/Counter & Input/Output
	Upload	

## Click on PLC 5 node 7

Communications					
Autobrowse Refresh	2a 📅	Browsing • node	47 not found		OK.
E B Workstation, LAB-B	Address	Device Type	Online Name	Status	Cancel
重 器 Linx Gateways, Etherne 重 器 AB_ETH-1, Ethernet	01	Computer SLC-5/04	EQ7000 SLC504	Program Program	Help
→ 品 AB_ETHIP-1, Ethernet	07	PLC-5/80E	PLC5TEST	Program	Qnline
⊡ 🚡 EQ/000, Data Highway					Online <u>N</u> ow
					□ Single □ Thread UpLoads
					<u>U</u> pload
Current Selection Server: RSLinx API	1	Driver: EQ70	00		Download Reply Timeout:
		Type: Not a	PLC, SLC, or CL	L A	poly to Project

## Click On Online

Communications					
Autobrowse Refresh	2a 💷	Browsing - node	35 not found		OK
, Workstation, LAB-B	Address	Device Type	Online Name	Status	Cancel
□ 器 Linx Gateways, Ethernet □ 器 AB_ETH-1, Ethernet	01	Computer SLC-5/04	EQ7000 SLC504	Program Program	Help
器 AB_ETHIP-1, Ethernet	<b>.</b> [[]07	PLC-5/80E	PLC5TEST	Program	Online
♣ EQ7000, Data Highway Plus 					Online <u>N</u> ow Single
					UpLoads Upload
- Current Selection		Driver: E0700	10		Reply Timeout:
Node: 7 Decimal (=7 Octal)		Type: PLC5	.0		10 (Sec.
					oply to Project
Going to Online Programming State					×
- Secreting for Offling Image					
Filename No Matching	File Found				
	The Found:				
SELECT FILE to merge for document	tation (names,	symbols, descriptio	ns, etc)		,
Online Processor Information					Cancel
Processor Name : PL	CSTEST				
Processor Type: PL Station # 7	L5/8UE Serie H	sD Hevla			anto Mour File
Program Files : 3					
DataFiles: 15	1			Linio	ad Logic Merge
Enhanced PLC5 Information				with	Existing File's
Last Edit TimeStamp :	8/13/2021	2:36:52		Comn	nent/Symbol DB
User Program Checksum :	3498				Province 1
Files Found With Mate	hing Online P	rocessor Name / P	assword		Blomse
Oploading Processor Image			×		
		Cancel	1		
		Cancer			
PLUSTEST K- PLUS/80E					
Reading in Channel Co	onfiguration 1	0/10			
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🔹 RSLogix 5 - PLCSTEST	
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T4:1 TON Timer On Delay	
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Preset 1<	
To go opling with the SLCE (04 start PSL ogivE00 and repeat same similar stops done above for PLCE	
To go online with the SEC5/04 start RSE0gix500 and repeat same similar steps done above for PEC5	
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No Edits Driver AB D Upload User ∡ Bit ∡ Timer/Counter ∡ Input/Output ∡ Compare	
Communications	
Image: Autobrowse Refresh       Image: Browsing - node 46 not found       OK       Image: Autobrowse Refresh       Image: Browsing - node 46 not found       OK	
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Help Help Help Help Help Help Help Help	
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Type: Not a PLC, SLC, or CL Apply to Project	t
County to online Programming state	
Filename : No Matching File Found	
SELECT FILE to merge for documentation (names, symbols, descriptions, etc)     Online Processor Information     Cancel	
Processor Name : SLC504 Processor Type : 1747-L541 5/04 CPU - 16K Mem. 0S401	
Station #: (3Dec) Program Checksum: 1c21	
Files Found With Matching Online Processor Name / Password Browse Uploading Processor Image	
Cancel	
Heading in Data Tables	



If you have any questions in regard this application or for more details please contact

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