

APPLICATION NOTE:

Reading/writing data from Anybus-S EtherNet/IP using ControlLogix5000 MSG instruction



HMS Industrial Networks

Revision Notes

Date:	Revision:	Notes:	Responsible
2003-08-22	0.10	Document created	Joakim Wiberg
2007-07-25	2.0	Revision	Thorbjörn Palm

Abbreviations

PLC	ControlLogix5000

1. System configuration overview

This is an example on how to read/write data in the Anybus-S Slave module using the ControlLogix5000 MSG instruction. It should however be possible to use this document as a guide how to do this using any "generic" EtherNet/IP module from HMS.

This application note assumes that RSLogix5000 and ControlLogix5000 with an EtherNet/IP module/bridge are set up and working correct.

The Anybus-S Slave module is configured for 4 bytes of data each direction, and have been assigned the IP-address 10.10.14.225.

2. Reading data

Either create a new project or use an existing, set the program in "Offline" mode. Under "Controller Tags" create two tags named "ReadTag" and "ReadData", and change the types to MESSAGE and SINT[4] respectively.





Right click on the "ReadTag" and select "Go to Message Properties".

A new dialog window should now occur, here we have to select the "Service Type" of "Get Attribute Single". To access the data stored in the Anybus-S Slave module fill in the "Class" as 4, "Instance" as 100 and "Attribute" 3. In the "Destination" dropdown box select the "ReadData" tag; in this tag the read data will be stored.

Message Configuration - ReadTag	×
Configuration* Communication Tag	
Message Type: CIP Generic	
Service Get Attribute Single	Source Element:
Service e (Hex) Class: 4 (Hex)	Destination ReadData
Instance: 100 Attribute: 3 (Hex)	New Tag
🔾 Enable 🔾 Enable Waiting 🔵 Start	O Done Done Length: 0
Error Code: Extended Error Code: Error Path: Error Text:	🥅 Timed Out 🗢
OK	Cancel Apply Help

Next select the "Communication" tab, first click on the "Browse" button. This will bring up a new window; here select the Ethernet module in the PLC and click OK.

Message Path Browser	l
Path: EtherNet_Bridge	
EtherNet_Bridge	
□ I/O Configuration [1] 1756-DNB DeviceNet [2] 1756-ENET/B EtherNet_Bridge [3] 1756-CNBR/D ControlNet	
OK Cancel Help	

Now the name of the Ethernet module should be filled in at the "Path", here we also have to fill in the full path to the Anybus-S Slave module (in this example the Anybus-S Slave module have the IP-address of 10.10.14.225). After the name of the Ethernet module in the PLC, add a comma, a space, and a 2, this indicates that the message should be routed out on Ethernet. Following the 2 add a comma, a space, and the IP-address to the Anybus-S Slave module, here 10.10.14.225. This is everything that has to be done here, click on OK.

Message Configuration - ReadTag
Configuration* Communication* Tag
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Path: EtherNet_Bridge, 2, 10, 10, 14, 225
Ethelinet_bildge, 2, 10,10,14,223
Communication Method © CIP O DH+ Channel: Destination Link:
C CIP With Source Link: 0 😴 Destination Node: 0 🔄 (Octal)
🔽 Connected 🔽 Cache Connections 🖌
🔾 Enable 🔾 Enable Waiting 🔾 Start 🔾 Done 🛛 Done Length: 0
🔾 Error Code: Extended Error Code: 🗌 Timed Out ፍ
Error Path: Error Text:
OK Cancel Apply Help

Under the "MainRoutine" in the "MainProgram" add a "MSG" instruction and select "ReadTag" as the "Message Control". This is a simple example that only will issue one read request, in a normal program some logic have to be added to trigger the instruction again, for more information regarding this issue refer to documentation for RSLogix5000.

🕌 RSLogix 5000 - CLOGIX5000 [1756-L55] _ 8 × File Edit View Search Logic Communications Tools Window Help - <u>***</u> 8 🗎 🚅 🖨 🏄 🛍 🖻 🗠 📔 Path: AB_ETH-1\10.10.14.80\Backplane\0 Offline 🗊 🗖 RUN - * No Forces I H H H MSG GSV SSV a = 1/0 No Edits Þ □ Favorites (Bit (Timer/Counter) Input/Output (Compare 🗎 MainProgram - MainRoutine* 🔄 Controller CLOGIX5000 Controller Tags
Controller Fault Handler 出 雪 雪 臣 🚞 Power-Up Handler * Type - CIP Gener Message Control 🕂 😽 Tasks 0 ŒN 🗄 😽 MainTask CER) 🗄 🕞 MainProgram Program Tags Unscheduled Programs (End) 😁 Motion Groups - 🗀 Ungrouped Axes Trends 🖹 🚖 Data Types 🚂 User-Defined 🗄 🙀 Strings 🗄 🔠 I/O Configuration [1] 1756-DNB DeviceNet
 [2] 1756-ENET/B EtherNet_Br
 [3] 1756-CNBR/D ControlNet [2] 1756-ENET/B EtherNet_Bridge MainRoutine* / • Ladder Diagram (Main) Type Description 1 Rung 0 of 1 APP VER Enter MESSAGE control structure operand 🚓 Start 🔢 🙆 🈂 🔰 🛛 🎯 RSLogix 5000 - CLOGI... 🗱 Paint Shop Pro - Image7 🖆 🍕 🍓 🛄 🔝 🛛 2:02 PM

Now download the program to the PLC and go "Online".

Here is the "Monitor Tags" tab under "Controller Tags" with the "ReadData" tag expanded, the data 0x11, 0x22, 0x33, 0x44 have been read from the ABS model.

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E Motion Groups	► P-ReadData	() ()Hex 🗾	SINT[4]	
Ungrouped Axes	+ ReadData[0]	16#11	Hex	SINT	
Trends	⊕ ReadData[1]	16#22	Hex	SINT	
E Data Types	+-ReadData[2]	16#33	Hex	SINT	
	+-ReadData[3]	16#44	Hex	SINT	
Predefined					
🗄 🙀 Module-Defined					
🖻 🔠 I/O Configuration					
[1] 1756-DNB DeviceNet					
[2] 1/56-EINET/B Etherinet_Bridge					
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3. Writing data

Go "Offline" and create two new tags named "WriteTag" and "WriteData", and change the types to MESSAGE and SINT[4].



Switch over to the "Monitor Tags" tab and fill in some data in the "WriteData" tag, this data will be written to the Anybus-S Slave module.

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Controller CLOGIX5000	Controller Tags - CLOGIX5000	(controller)				
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Power-Up Handler	Tag Name 🗸 🖓	Value 🔸 Fo	orce Mask 🛛 🗲	Style Type	e	
😑 😁 Tasks	+ HelpTag	0	l li	Decimal DIN1	r	
🖻 🧔 MainTask	- Local:1:1	{}	{}	AB:1	756_DNB_8Bytes:1:0	
🖃 🥰 MainProgram	+-Local:1:0	{}	{}	AB:1	756_DNB_8Bytes:0:0	
MaioRoutipe	+-Local:1:S	{}	{}	AB:1	756_DNB_Status_128Bytes:S	3:0
		{}	{}	MES	SAGE	
😑 😁 Motion Groups		{}	{}	Hex SIN1	[4]	
Ungrouped Axes		{}	{}	MES	SAGE	
Trends	-WriteData	{}	{}	Hex SIN1	[4]	
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Right click on the write tag and select "Go to Message Properties", to bring up the configuration window. Now we're writing data so the "Service Type" should be "Set Attribute Single" and the "Instance" 150, the "Class" and "Attribute" should be the same as used when reading data.

For "Source Element" select the "WriteData" tag and the "Source Length" should be 4 bytes.

Under "Communication" tab the "Path" should be the same as the one used to read data.

Message Configuration - WriteTag	×
Configuration* Communication Tag	
Message Type: CIP Generic	
Service Set Attribute Single	Source Element: WriteData
Service 10 (Hex) Class: 4 (Hex)	Destination
Instance: 150 Attribute: 3 (Hex)	New Tag
🔾 Enable 🔾 Enable Waiting 🔾 Start	🔾 Done 🛛 Done Length: 0
 Error Code: Extended Error Code: Error Path: Error Text: 	🔲 Timed Out 🗲
OK	Cancel Apply Help

Go the "MainRoutine" and add one more MSG instruction, for new instruction select "WriteTag" as the "Message Control".

Switch to "Online" and download the program, the data what was filled in for the "WriteData" are now being written to the Anybus-S Slave module.



4. Links to information about networks and products

- The latest for the ABS module can be found on the HMS homepage <u>http://www.anybus.com/</u>.
- The Open DeviceNet Vendor Organization has a homepage, <u>http://www.odva.org/</u>, with more information about EtherNet/IP.
- For information concerning the PLC and EtherNet/IP scanner refer to the Allen-Bradley's homepage <u>http://www.ab.com/</u>.

5. Support

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