

Using a HMS Anybus Ethernet Communicator with an Allen Bradley SLC 5/05 Controller

Application Summary

This document explains the procedure for configuring communications between an Allen Bradley SLC 5/05 and the HMS Anybus Ethernet Communicator. Through a message instruction called the Ethernet/IP Explicit Message (EEM) in the SLC 5/05 processor, it is possible to read and write data from an Anybus Ethernet Communicator.

Application Equipment and Materials

Materials used in the development of this application note are as follows:

- Hardware used in development of application note: HMS Anybus Communicator Ethernet to Serial Gateway (HMS part no. AB7007), Allen Bradley SLC 5/05 processor with OS firmware level Series C, FRN 10 (AB part no. 1747-L553)
- Software used in the development of application note: HMS ABC Configurator Software Version 2.22, RsLogix 500 Pro Software Version 7.10
- Documentation consulted: Anybus Communicator Ethernet User Manual ver. 2.10, Allen Bradley Publication 1747-RM001E-EN-P January 2006.
- Appropriate Programming Cables (AnyBus Configurator Cable, Ethernet Cable)

Anybus Communicator IO Size

In this example, the Anybus Communicator was setup for 14 bytes of Input data and 7 bytes of Output data. The serial configuration setup for each application in the Anybus Communicator is going to have a different amount of bytes. To check the amount of Input and Output bytes in the application, right click on the Sub-Network and select "Sub-Network Monitor" as shown in figure1 below.





A Sub-Network Monitor screen should now appear. This will show the number of Input bytes (14) and the number of Output bytes (7) in the Anybus Communicator. If there are no colored boxes, this means that the Anybus Communicator has not been setup yet. Proceed to setup the serial interface of the Anybus Communicator before going on.

😵 Sub-network Monitor		
file Columns		
# #		
New Node		
Select All Deselect All		
✓ Transactions 1		
In Area 14 bytes (512)	Out Area 7 bytes (512)	General Area 0 bytes (1003)
		0400 0410 0420 0430



Figure 2

SLC 5/05 Setup

Communicating to the Anybus Communicator for Ethernet is done through a Ethernet/IP Explicit Message (EEM) message instruction. The EEM instruction can be used with any SLC 5/05 processor at OS firmware level Series C, FRN 10 or higher. The EEM message instruction is a control block for storing the instruction parameters and configuration setup screen, similar to a MSG instruction. The Ethernet CIP command consists of a Service Code; the object Class, Instance and Attribute and the Send/Receive Data.

First, to read the Input bytes in the Anybus Communicator, add an EEM message instruction in RsLogix 500. Under, the General tab set the size of the words and the data table address in the message instruction. The service code for a "Read" is an "E" in hexadecimal. The class for the inputs on the Anybus Communicator is 4, with the instance being 64 (hex) and attribute being 3. Also, adjust "Size in Words (Receive Data)" to 124. It should look similar to Figure 3.



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🗮 EEM - N9:0 : (58 Elements)	
General MultiHop Send Data Receive Data	
This Controller Channel : 1 Size in Words (Receive Data): 124 (Send Data): 0 Data Table Address (Receive Data): N10:0 (Send Data): N/A Target Device Message Timeout [x1 sec]: 23 MultiHop: Yes Service: Read Assembly Class (hex): 4 (dec): 4 Instance (hex): 64 (dec): 100 Attribute (hex): 3 (dec): 3	Message Control Bits Ignore if timed out (TO): 0 Awaiting Execution (EW): 0 Continuous Run (CO): 0 Error (ER): 0 Done (DN): 1 Transmitting (ST): 0 Enabled (EN): 1 Waiting for Queue Space : 0 Error Error Code (hex): 0
No errors	
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Figure 3

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🚟 EEM - N9:0 : (58 Elements)				
General MultiHop Send Data R	eceive Data			
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From Device	From Port	To Address Type	To Address	
This SEC500	1	EtherNet/IP Device (str.)	10.10.14.229	_
For Help, press F1			0:0000	2:00 READ Administrat

Figure 4



Next, select the "MultiHop" tab. In this tab, enter the IP address of the Anybus Communicator. Save the program and download to the SLC 5/05. This message instruction should now read the 14 input bytes and place them in the N10:0 data table address.

Now, in order to write to the output data in the Anybus Communicator, add an EEM message instruction again to RsLogix 500. Under the "General" tab, the service code will now be 10 (hex). Set the send data size, along with the data table address. In this example, a size of 3 with N11:0 is being used. On the Anybus Communicator, the Class is 4, with the Instance being 96 (hex) and Attribute being 3. This is shown in Figure 5 below.

Figure 5

Next, select the "MultiHop" tab and type in the IP address of the Anybus Communicator. Under the "Send Data" tab will be the data that gets sent to the Anybus Communicator module. This is shown in Figure 6.



RSLogix 500 Pro - UNTITLED.RSS	
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REMOTE RUN ± No Forces ■ No Edits ● Forces Disabled ● Driver: AB_DF1-1 Node : 1d ● ●	ABL ABS
🔁 EEM - N9:0 : (58 Elements)	<u>_ </u>
General MultiHop Send Data Receive Data	
Rute Offset 0 1 2 3 4 5 6 7 8 9	
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For Help, press F1	0:0000 2:00 READ Administrat

Figure 6

When the message instruction gets executed, the following output values will get sent to the Anybus module. To view the current input and output data that's on the Anybus Communicator, right click on the Node and select "Node Monitor" as shown below in Figure 7. A monitor screen will appear, showing the input and output bytes in grey.







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🛞 Monitor - New I	Node							
File Node Command	d Columns View							
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Read Coils Query					643 1			
Slave Address	Function	Start	ing Address (Hi,Lo)	Quantity Of Outputs (Hi,I	Checksur	n		
/alue	Value		e	Value	Error check type		Error check start byte	
)x01	0x01		100	0x0000 CRC			0x0000	
In Area 14 butes (512)			Out Area 7 butes (512)		General Ar	rea 0 butes (1003)	
MARCE 14 Dytes (312) 0000 0008 0010 0018 0020 0028 0030 0030 0038 0040 0048 0040			0200 0208 0210 0218 0220 0228 0230 0238 0230 0238 0240 0248 0250			0400 0408 0410 0418 0420 0428 0420 0428 0430 0438 0430 0438 0440 0448 0450		

Figure 8

The data shown inside the gray boxes is actual data that is inside the Anybus module. After the message instruction has been executed, the data values set earlier in the message instruction, can now be seen in the output table in the Anybus Communicator through Node Monitor.

🛞 Monitor - New Node					_ 🗆 ×
File Node Command Columns View					
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Read Coils Query					
Slave Address Function	Starting Address (Hi	Lo) Quantity Of Outputs	: (Hi,I Checksum		
Value Value	Value	Value	Error check type	Error check start byte	
0x01 0x01	0x0000	0x0000	CRC	0x0000	
Read Coils Response					
Slave Address Function	Byte count	Coil Status	Checksum		
	1				
In Area 14 bytes (512) Out.		es (512)	Genera	al Area 0 bytes (1003)	
0010 0 0018 0 0020 0 0028 0 0030 0 0040 0 0040 0 0050 0 0050 0 0050 0 0058 0 0070 0 0078 0 0080 0 0090 0 0040 0 0040 0 0040 0 0040 0 0040 0 0040 0 0040 0 0040 0 0048 0 0050 0 0050 0 0050 0 0050 0 0050 0 0050 0	0210 0218 0228 0228 0230 0238 0240 0248 0255 0260 0258 0268 0270 0278 0288 0290 0298 0240 0288 0290 0298 0280		0410 0428 0428 0438 0448 0448 0448 0448 0448 0450 0450 045	Image Image <td< th=""><th></th></td<>	

Figure 9



If problems exist, verify cable connection and make sure the communication parameters match between the SLC 5/05 and the Anybus Communicator. If troubles continue, call HMS Industrial Networks for technical support.

Web References:

- <u>www.hms-networks.com</u>
- http://www.ab.com/

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