APPLICATION NOTE:

Reading and writing ControlLogix5000 tags using Anybus-S Slave EtherNet/IP

Revision Notes

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

References

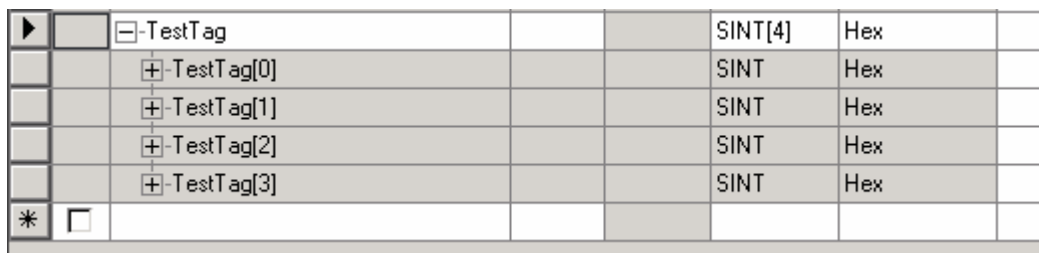| Ref#1	"Anybus Slave Design Guide Anybus-S Parallel Interface", HMS Industrial Networks, http://www.anybus.com
Ref#2	"Fieldbus Appendix Anybus-S Ethernet Anybus-S Slave EIT-2 - Modbus/TCP, EtherNet/IP & IT Functionality", HMS Industrial Networks, http://www.anybus.com
Ref#3	"EtherNet/IP Specification", Open DeviceNet Vendor Organization, www.ethernet-ip.org
Ref#4	"Logix5000 Data Access", Rockwell Automation, http://www.automation.rockwell.com/enabled/guides.html

1. Overview

This document describes how to read and write ControlLogix5000 tags using AnyBus-S EtherNet/IP. This is accomplished using the mailbox command "Send UCMM", command number 0x008A, on the AnyBus-S module.

2. Create a tag

First start RSLogix5000 and either create a new project or open an existing.

Create a new tag; RsLogix5000 must be in offline mode to be able to do this, open up the "Controler Tag" window and select "Edit Tags". Here create a tag named "TestTag", make sure to leave the "Produced" box unchecked. Select SINT[4] as the type for the tag, this will create an array of four bytes. Also change the tag style to Hex.

▶		⊟-TestTag		SINT[4]	Hex
		⊞-TestTag[0]		SINT	Hex
		⊞-TestTag[1]		SINT	Hex
		⊞-TestTag[2]		SINT	Hex
		⊞-TestTag[3]		SINT	Hex
✳	☐				

Go online and download the project to the ControlLogix processor and switch over to "Remote Run" mode.

3. Read the tag

First enter 01 02 03 04 in the tag, so there is some "data" to read.

The following mailbox telegram will read the tag named "TestTag" in the ControlLogix processor. The ip-address used is 10.10.14.80 and the processor is installed in slot 0, the ControlLogix back plane have port number 1.

```
0000    00 0A 40 02 00 8A 00 1C 00 01 00 01 00 00 00 00
0010    0A 0A 0E 50 00 00 00 00 00 00 00 00 00 00 00 00
0020    52 02 20 06 24 01 0A F0 0E 00 4C 05 91 07 54 65
0030    73 74 54 61 67 00 04 00 01 00 01 00
```

Address 0000 to 0010 contains the mailbox header that won't be discussed here, for more information about this see Ref#1 and Ref#2.

The break down of the data section:

52	Service code, Unconnected send, see Ref#3
02 20 06 24 01	Path to service destination (Class 6, Instance 1)
0A	Priority/Time_tick
F0	Time-out_ticks
0E 00	Message request size (14 bytes)
4C	CIP read data service, see Ref#4
05 91 07 54 65 73 74 54 61 67 00	IOI referring to "TestTag"
04 00	Number of elements to read
01 00 01 00	IOI referring to port 1 slot 0

This is the expected successful mailbox response.

```
0000   00 0A 00 02 00 8A 00 0A 00 01 00 01 00 00 00 00
0010   0A 0A 0E 50 00 00 00 00 00 00 00 00 00 00 00 00
0020   CC 00 00 00 C2 00 01 02 03 04
```

The break down of the data section:

CC	Service code response, CIP read data service
00	Reserved
00	Status, success
00	Additional status size
C2 00	Data type SINT, see Ref#4
01 02 03 04	Data

4. Write data to the tag

Here is the mailbox command to write data to a ControlLogix processor, the same setup as for the read is used.

```
0000    00 0A 40 02 00 8A 00 22 00 01 00 01 00 00 00 00
0010    0A 0A 0E 50 00 00 00 00 00 00 00 00 00 00 00 00
0020    52 02 20 06 24 01 0A F0 14 00 4D 05 91 07 54 65
0030    73 74 54 61 67 00 C2 00 04 00 11 22 33 44 01 00
0040    01 00
```

In RsLogix 5000, verify that the data was written to the tag.

The break down of the data section:

52	Service code, Unconnected send, see Ref#3
02 20 06 24 01	Path to service destination (Class 6, Instance 1)
0A	Priority/Time_tick
F0	Time-out_ticks
14 00	Message request size (20 bytes)
4D	CIP write data service, see Ref#4
05 91 07 54 65 73 74 54 61 67 00	IOI referring to "TestTag"
C2 00	Data type SINT, see Ref#4
04 00	Number of elements to write
11 22 33 44	Data to write
01 00 01 00	IOI referring to port 1 slot 0

This is the expected successful mailbox response.

```
0000    00 0A 00 02 00 8A 00 04 00 01 00 01 00 00 00 00
0010    0A 0A 0E 50 00 00 00 00 00 00 00 00 00 00 00 00
0020    CD 00 00 00
```

The break down of the data section:

CD	Service code response, CIP write data service
00	Reserved
00	Status, success
00	Additional status size

5. Links to information about networks and products

- The latest info for the Anybus-S Slave module can be found on the HMS homepage http://www.anybus.com.

- The Open DeviceNet Vendor Organization has a homepage, http://www.odva.org/, with more information about EtherNet/IP.

- To learn more about the ControlLogix5000 refer to the Rockwell Automation Enabled page http://www.automation.rockwell.com/enabled.

6. Support

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