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Application Note – Ethernet IP comms to IFM AC1421 ASI

i4 Automation Ltd
Innovative Solutions for Industry

Gateway

T2O and O2T

Absolutely essential to get these numbers correct, they appear to be defined by the target programmer and should be in the documentation.

Input & Output

Make sure that these variables are the correct length and are defined as buffers or make a STRUCT of the correct size & type. For the AC1421 these values are:

➕ **Add New Scanner Node**

Node Name	Node IP	RPI [ms]	T2O Assemb	Input	Input Size (B	O2T Assemb	Output	Output Size	Configuratio	Config
IFM AC1421	192.168. 0 . 89	128	100	IFM_Input	496	150	IFM_Output	496	0	<Empty>

See the AC1421 Device Manual. Max variable size is 248 INT16.

AC1421 setup

Power up the AC1421 using the +24V/0V connections and also connect the ASI+/ASI- to an ASI power supply such as an AC1254. Also connect the AC1254 to one or more ASI slaves.

Connect the AC1421 to a PC via the X3 Configuration terminal using an Ethernet patch lead. Connect the PLC to the AC1421 via the X6 Ethernet IP port with an Ethernet patch lead.

The AC1421 can be configured via the Web Server function, note the IP address for configuration is different to the IP address for the Ethernet IP port.

To get the Ethernet IP working go to the Fieldbus setup page and add in a static IP address with subnet mask and gateway. Select Independent mode and ACCEPT modifications. Leave everything else at default.

ASI setup, add slave device and select Projection Mode, this enables the Start Projection Process button, start the process. This should look for slaves on the network. Leave everything else at default.

Unistream 7 program

IFM AC1421 Ethernet IP.ulpr

Addressing

The system was setup with an AC5204 A/B node on slave ID 3 which consists of 4 inputs and three outputs.

The inputs returned data into bits 0-3 of IFM_Input_0 and the outputs were set by writing to bits 0-2 of IFM_Output_0. The table below from the AC142 Device manual P181 shows the mapping of slave ID3 to bits 0-3.

An AC5227 slave ID2 was added which consists of 2 inputs and 2 pneumatic outputs, these mapped to bits 4-7 of the input and output variables.

NB The address of the slave can be changed by the Web Server software to whatever is required, look under Quick Setup – ASI address configuration.

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Mapping of the digital input/output data

13447

This table illustrates the mapping of digital input/output data of the individual slaves to the bytes of the transmitted words:

Word	AS-i slave addresses			
	Bits 15...12	Bits 11...8	Bits 7...4	Bits 3...0
1	M flags*	1(A) / 1B	2(A) / 2B	3(A) / 3B
2	4(A) / 4B	5(A) / 5B	6(A) / 6B	7(A) / 7B
3	8(A) / 8B	9(A) / 9B	10(A) / 10B	11(A) / 11B
4	12(A) / 12B	13(A) / 13B	14(A) / 14B	15(A) / 15B
5	16(A) / 16B	17(A) / 17B	18(A) / 18B	19(A) / 19B
6	20(A) / 20B	21(A) / 21B	22(A) / 22B	23(A) / 23B
7	24(A) / 24B	25(A) / 25B	26(A) / 26B	27(A) / 27B
8	28(A) / 28B	29(A) / 29B	30(A) / 30B	31(A) / 31B

Legend:

*... The master flags (M flags) are only transmitted in the digital input data (→ Table: master flags (→ page 182)).

The other area to watch is the Ethernet IP module configuration table.

IFM_Input(248)

Module	Data bytes	
1	1-16	Digital inputs 1A-31A
2	17-32	Digital outputs 1A-31A
3	33-64	Analogue inputs slaves 1-8
4		Empty or outputs
5		Empty or outputs
6		Empty or outputs
7		Empty or outputs
8		Empty or outputs
9		Empty or outputs
10		Empty or outputs
11		Empty or outputs
12		Empty or outputs
13	65-68	Diagnostics
14		
15		
16		

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Under EthernetIP – Module Configuration it is possible to remap the offset in which the bytes appear in the Unilogic IFM_Input and IFM_Output variables. The configuration table lists module numbers 1 thru 16 consisting of both inputs from and outputs to the ASI network, however only sections of these are mapped into the Unilogic variables, the table above showing the IFM_Input allocation where both the digital inputs and outputs have space allocated but only the analogue inputs take space, the effect being of dragging the diagnostic data forward in the variable array to addresses 65-68 (with an analogue input allocation of 32 bytes from the 16 byte default.

Tony Spearing
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