AKD2G PushCorp Standard Interface

Hardwired Signals

X21/A3 (DIN 1) – Fault Reset

X21/A4 (DIN 2) – Analog Run[2]

X21/A5 (DIN 3) – Hardware Enable[1]

X21/B7 (DOUT 1) – Motor Overload Warning[2]

X21/B5-B6 (DOUT 9) – BTB/RTO

X21/A1-A2 (AIN ±10VDC) – Command Velocity[2]

X21/B1-B2 (AOUT 0-10VDC) – Actual Velocity[2]

X21/A11-B11 – STO Inputs[1]

X21/B3 – DIO 24V Supply

X21/B4 – DIO 0V/COM

[1] Required for Operation

[2] Analog/Discrete Control Only

Fieldbus - EthernetIP

Scanlist Data

VendCode	452
VendName	Kollmorgen
ProdType	43
ProdTypeStr	Generic
ProdCode	20
MajRev	1
MinRev	3
ProdName	AKD2G-SPI

	Instance	Bytes	Words
Producing	104	14	7
Consuming	103	6	3

IP Addresses

Service Port	192.168.1.13
EthernetIP	192.168.1.14

IO Maps

Control Inputs from AKD2G			
Word	**Byte**	**Bit**	**Description**
0	0	0	Fault
		1	User Configurable
		2	At Tool Change*
		3	User Configurable
		4	User Configurable
		5	User Configurable
		6	User Configurable
		7	User Configurable
	1	8	User Configurable
		9	User Configurable
		10	User Configurable
		11	User Configurable
		12	User Configurable
		13	User Configurable
		14	User Configurable
		15	User Configurable
1	2-3	N/A	Actual Velocity
2	4-5	N/A	
3	6-7	N/A	Actual Amperage
4	8-9	N/A	
5	10-11	N/A	Motor Temperature
6	12-13	N/A	

Control Outputs to AKD2G			
Word	**Byte**	**Bit**	**Description**
0	0	0	Clear Fault
		1	Velocity Enable
		2	Go Tool Change*
		3	User Configurable
		4	User Configurable
		5	User Configurable
		6	User Configurable
		7	User Configurable
	1	8	User Configurable
		9	User Configurable
		10	User Configurable
		11	User Configurable
		12	User Configurable
		13	User Configurable
		14	User Configurable
		15	User Configurable
1	2-3	N/A	Velocity Command
2	4-5	N/A	

*For STC1015 and STC1515 Only

IO Scaling

Command and Actuals are 32-bit signed integers.

Velocity scaling is whole digit RPM
Example: Reading 6,000(base 10) on the integer is 6,000 RPM

Amperage scaling is 0.001mA.
Example: Reading 2,356(base 10) on the integer is 2.356 amps

Temperature scaling is 0.001 degrees Celsius.
Example: Reading 27,018(base 10) on the integer is 27.018°C

16-bit Tips and Tricks

IF $Word2*2^{16}+Word1 > 65536$ THEN
    $ActVel = Word2*2^{16}+Word1$
ELSE
    $ActVel = Word2*2^{16}+Word1 - 2^{32}$

IF $Word4*2^{16}+Word3 > 65536$ THEN
    $ActAmp = (Word4*2^{16}+Word3)/1000$
ELSE
    $ActAmp = (Word4*2^{16}+Word3 - 2^{32})/1000$

IF $Word6*2^{16}+Word5 > 65536$ THEN
    $MotTemp = (Word6*2^{16}+Word5)/1000$
ELSE
    $MotTemp = (Word6*2^{16}+Word5 - 2^{32})/1000$

Negative Command Values

Operating the spindle in the reverse direction via EthernetIP requires a negative value at the Group/BTD/BITS output word for the Command Velocity.

From a scalar point of view, this is managed with the 2's compliment of the number across the 32-bit word.

Some robots and PLCs will automatically resolve the 2's compliment when a negative number is put to the word; simpler systems will require manipulation of the value.

For example, the target is to reverse 5,000 RPM, and we are working with the 32 bit word for the AKD2G EIP Velocity Command.

5,000(b10) is 00000000000000000001001110001000(b2)

Invert all the bits -> 11111111111111111110110001110111(b2)

Add one -> 11111111111111111110110001111000(b2)

11111111111111111110110001111000(b2) is 4,294,962,296(b10)

For the 32 bit word, -5,000 has the scalar value of 4,294,962,296

A simple algorithm can accomplish this with basic mathematic operators (pseudo code):

```
IF [desired velocity] < 0 THEN
   [command velocity] = 2^32 – ABSVAL([desired velocity])
ELSE
   [command velocity] = [desired velocity]
END
```

2^{32} = 4,294,967,296

4,294,967,296 – 5000 = 4,294,962,296