



AHX5 IO-LINK OPERATING INSTRUCTIONS – FIRMWARE V1.1



ELECTRICAL INSTALLATION

BD : PUR Cable M12 5 pins (Device class B)

Pin number	Function - Incremental mode	Function - IO-link mode	Illustration
1	Brown	L+ : power supply V+	
2	White	N.C.	
3	Blue	L- : power supply GND	
4	Black	IO-Link	
5	Grey	N.C.	

BF : Connector M12 5 pins (Device class B)

Pin number	Description	Illustration
1	L+ : power supply V+	
2	N.C.	
3	L- : power supply gnd	
4	IO-Link	
5	N.C.	

BJ : PVC Cable 3 wires

Pin number	Color	Description
1	Brown	L+ : power supply V+
2	White	L- : power supply GND
3	Green	IO-Link



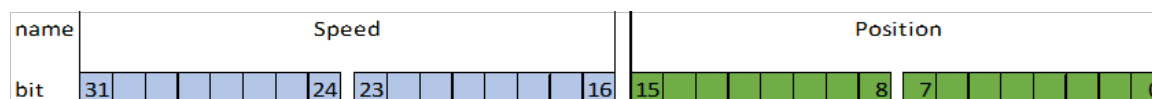
IO-LINK SPECIFICATION INFORMATION

Device specification

Specification	IO-Link description	Value
Transfer rate	COM3	230.4 kBaud
Minimum cycle time of device	Minimum cycle time	0x0A (1ms)
Frame specification Amount of preoperate data required Amount of operate data required Enhanced parameters	M-Sequence Capability: M-Sequence Type Preoperate M-Sequence Type Operate ISDU supported	TYPE_0 TYPE_2_V Supported
IO-Link protocol version	Revision ID	0x11 (Version 1.1)
Amount of process data from the device to the master	ProcessDataIn	0x83 (4 bytes)
Amount of process data from the master to the device	ProcessDataOut	0x00 (0 byte)
Manufacturer ID	Vendor ID	0x0468 (1128)
Device identification	Device ID	0x0004

Process data

Name	Description	Datatype	Bitoffset	Bitlength	Value Range	Unit
Speed	Rotating speed	IntegerT	15	16	-12000 to 12000	rpm
Position	Absolute position counter	UIntegerT	0	16	0 to 65535	



When the absolute position resolution is configured to a value smaller than 16 bits, the data is aligned on the bit 0.

For example, if the absolute position resolution (index 90) is configured to 12 bits, the bits 0 to 11 will contain the data. Bits 12 to 15 will then be unused and set to zero.

Standard Identification data

Index (hex)	Sub index	Name	Data type	Access	Contents
16 (0x10)	0	Vendor Name	StringT	RO	BEI Sensors
17 (0x11)	0	Vendor Text	StringT	RO	Sensata Technologies Inc.
18 (0x12)	0	Product Name	StringT	RO	AHx5-ZIO
19 (0x13)	0	Product ID	StringT	RO	Detailed reference
20 (0x14)	0	Product Text	StringT	RO	Absolute single-turn IO-Link encoder
21 (0x15)	0	Serial Number	StringT	RO	Unique number
22 (0x16)	0	Hardware Version	StringT	RO	284v6
23 (0x17)	0	Firmware Version	StringT	RO	V1.1
24 (0x18)	0	Application Specific Tag	StringT	RW	***

System command

Index (hex)	Subindex	Name	Data type	Access	Value range
2 (0x02)	0	System-Command	UIntegerT 8	WO	130 (0x82) : Restore factory settings
					131 (0x83) : Back-to-Box command

Observation parameters

Index (hex)	Subindex	Name	Data type	Access	Value range	Comment
40 (0x28)	0	Process Data Input	Record	RO		Get last Process Data Input value
	1	Speed	IntegerT 16	NA	-12000 to 12000	Speed value.
	2	Position	UIntegerT 16	NA	0 to 65535	Absolute position

Diagnosis parameters

Index (hex)	Subindex	Name	Data type	Access	Value range	Comment
36 (0x24)	0	Device Status	UIntegerT 8	RO	0 to 4	Device status : Device is OK [0] Maintenance required [1] Out of specification [2] Functional check [3] Failure [4]
110 (0x6E)	0	Operating hours	UIntegerT 32	RO	0 to 4294967295	Number of hours with device on

Sensata specific parameters, Observer and Maintenance access

Index	Subindex	Name	Data type	Access	Value range	Comment
65 (0x41)	0	Set Position Preset	Button	WO		Set position to the preset value
67 (0x43)	0	Position Preset value	UIntegerT 16	RW	0 to 65535	Value of the position preset
72 (0x48)	0	Rotation direction	BooleanT	RW	False : CW True : CCW	Set the rotation direction
80 (0x50)	0	Speed calculation window	UIntegerT 8	RW	0 : 20 ms 1 : 200 ms 2 : 600 ms	Time between each speed data update
90 (0x5A)	0	Absolute Position Resolution	UIntegerT 8	RW	1 to 16 Number of bits	Default value: 16 bits

Sensata specific parameters, Specialist access

Index	Subindex	Name	Data format	Access	Value range	Comment
75 (0x4B)	0	Enter in Factory setup mode	BooleanT	RW	0: Encoder mode 1: Factory mode	Do not use
252 (0xFC)	0	Test parameter 252	UIntegerT 8	RW	0 : A appears 1 : A disappears 2 : B appears 3 : B disappears	Do not use For IO-link test purpose.

Factory settings parameters

Name	Index	Factory Setting	Comment
Position Preset value	65	0	Value of the position preset
Rotation direction	72	false : CW	Set the rotation direction
Enter in Factory setup mode	75	0: Encoder mode	Do not use
Speed calculation window	80	1 : 200ms	Time between each speed data update
Absolute Position Resolution	90	16	Resolution of the turn counter (in bits)
Operating-hours	110	0	Number of hours with device on

Events

Code	Name	Type	Comment
16912 (0x4210)	Temperature issue	Warning	event appears when temperature exceeds specifications.
4096 (0x1000)	General malfunction	Error	Global error on the device
35840 (0x8C00)	Tech Specific app fault	Error	Technology specific application fault – Reset Device
35841 (0x8C01)	Simulation active	Warning	Device in setup mode, the process data are not representing encoder position. Check operational mode
35888 (0x8C30)	Process variable range under-run	Warning	Process Data uncertain. The process data send is not reliable. Do not use device process data!
36000 (0x8CA0)	Sensor start error	Error	Communication error with the sensing part. Power Reset the device
36001 (0x8CA1)	Download from NVM error	Error	Error while reading from permanent memory Warning parameters load error
36002 (0x8CA2)	Upload to NVM error	Error	Error while writing to permanent memory Warning parameters save error
35888 (0x8C30)	Test Event A	Error	Event appears by setting index 252 to value 1, Event disappears by setting index 252 to value 2
36351 (0x8DFF)	Test Event B	Error	Event appears by setting index 252 to value 3, Event disappears by setting index 252 to value 4

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