

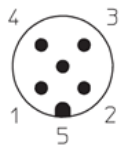
DXH5 IO-LINK OPERATING INSTRUCTIONS – FIRMWARE V1.2

ELECTRICAL INSTALLATION

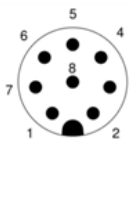
RGY : Incremental OR IO-link on Z (multiplexed)

There are two different modes, by default the encoder is in incremental mode. After an IO-link WAKEUP request, the encoder switches in IO-Link mode : the Z incremental signal is disabled and is configured to be the IO-link C/Q pin.

BF : Connector M12 5 pins (Device class B)

Pin number	Function - Incremental mode	Function - IO-link mode	Illustration
1	V+	L+: power supply	
2	A incremental signal	N.C.	
3	GND	L-: power supply	
4	Z incremental signal	IO-Link	
5	B incremental signal	N.C.	

GM : Connector M12 8 pins

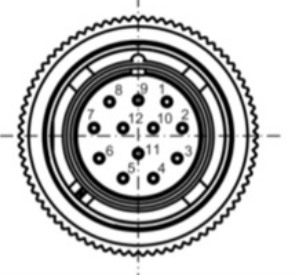
Pin number	Function - Incremental mode	Function - IO-link mode	Illustration
1	GND	L-: power supply	
2	V+	L+: power supply	
3	A incremental signal	N.C.	
4	B incremental signal	N.C.	
5	Z incremental signal	IO-Link	
6	A/ incremental signal	N.C.	
7	B/ incremental signal	N.C.	
8	Z/ incremental signal	N.C.	

*Adapter M12 8 pins to M12 5 pins (IO-link device class B) reference : to define

Electronics RGZ : Incremental AND IO-link (simultaneous)

For this configuration, the incremental signals and IO-link are all available simultaneously. Then the incremental signals can be incoherent few milliseconds after a configuration update from an IO-link command.

I6 : Connector M23 12 pins CW

Pin number	Description	Illustration
1	L- power supply GND	
2	L+ power supply V+	
3	A incremental signal	
4	B incremental signal	
5	Z incremental signal	
6	A/ incremental signal	
7	B/ incremental signal	
8	Z/ incremental signal	
9	IO-Link	
10	N.C.	
11	N.C.	
12	N.C.	

* Adapter M23 12 pins to M12 5 pins (IO-link device class B) reference : to define

GP : PUR cable 8 wires

Color	Function - Incremental mode	Function - IO-link mode
White	GND	L-: power supply
Blue	V+	L+: power supply
Grey	A incremental signal	N.C.
Brown	B incremental signal	N.C.
Red	Z incremental signal	IO-Link
Pink	A/ incremental signal	N.C.
Green	B/ incremental signal	N.C.
Black	Z/ incremental signal	N.C.

G3 : PVC cable 8 wires

Color	Function - Incremental mode	Function - IO-link mode
White	GND	L-: power supply
Brown	V+	L+: power supply
Green	A incremental signal	N.C.
Yellow	B incremental signal	N.C.
Grey	Z incremental signal	IO-Link
Pink	A/ incremental signal	N.C.
Blue	B/ incremental signal	N.C.
Red	Z/ incremental signal	N.C.

IP : PUR cable 9 wires

Color	Description
White	L- power supply GND
Blue	L+ power supply V+
Grey	A incremental signal
Brown	B incremental signal
Red	Z incremental signal
Pink	A/ incremental signal
Green	B/ incremental signal
Black	Z/ incremental signal
Brown / Grey	IO-Link



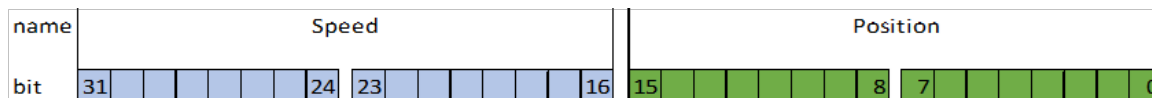
IO-LINK SPECIFICATION INFORMATION

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	RGY : 0x0003 RGZ : 0x0005

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	
					RGY	RGX
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	DHx5-RGY	DHx5-RGX
19 (0x13)	0	Product ID	StringT	RO	Detailed reference	Detailed reference
20 (0x14)	0	Product Text	StringT	RO	Incremental encoder configurable by IO-Link	Incremental and IO- Link absolute 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	V1.2	
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]
0 : normal operation	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
70 (0x46)	0	Encoder Output	BooleanT	RW	False: TTL True: HTL	Set the incremental output voltage
71 (0x47)	0	Incremental Resolution	UIntegerT 16	RW	1 to 10000	Set the incremental resolution
72 (0x48)	0	Rotation direction	BooleanT	RW	False: CW True: CCW	Set the rotation direction
73 (0x49)	0	Set Zero Position	Button	WO		Set zero position
74 (0x4A)	0	Z pulse width	UIntegerT 8	RW	0: 90° 1: 180° 2: 270° 3: 360°	Set the zero pulse format (see table 1)
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

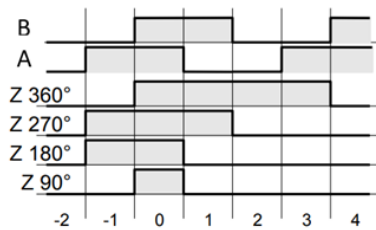


Table 1 : Z pulse width definition

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
Encoder Output	70	1 : HTL	Set the incremental output voltage
Incremental Resolution	71	1024	Set the incremental resolution
Rotation direction	72	false : CW	Set the rotation direction
Z pulse width	74	0 : 90°	Set the zero pulse format (see table 1)
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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