Sensata
Technologies

TCW4 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	0x0001

ELECTRICAL INSTALLATION

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

Pin number	Color	Description	Illustration
1	Brown	L+ : power supply V+	
2	White	N.C.	
3	Blue	L- : power supply, 0V (ref)	
4	Black	IO-Link	
5	Grey	N.C.	

Process data

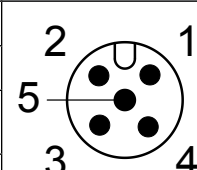| Name	Description	Datatype	Bitoffset	Bitlength	Value Range	Unit
Multiturn	Multiturn counter	IntegerT	16	16	0 to 65535	
Position	Absolute position inside turn	IntegerT	2	14	0 to 4095	
Flag2	Absolute position error True: if Magnetic field issue = True Or after event 0x1801 followed by power reset False: if no error or after set Zero or set Preset or Restore Factory Settings	BooleanT	1		true false	
Flag1	Magnetic field issue Problem with the magnet position	BooleanT	0		true false	

name	Multiturn Counter	Position	Flag2	Flag1
bit	31 ... 24 23 ... 16	... 8 7 ... 2	1	0
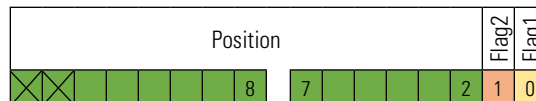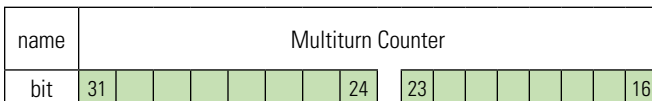
Note: bits 14 and 15 are '0'

Identification data

Index (hex)	Subindex	Name	Data type	Access	Contents	Comment
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	TCW4-ZIO	
19 (0x13)	0	Product ID	StringT	RO	TCW4	
20 (0x14)	0	Product Text	StringT	RO	Absolute modular multiturn sensor	
21 (0x15)	0	Serial Number	StringT	RO		
22 (0x16)	0	Hardware Version	StringT	RO		
23 (0x17)	0	Firmware Version	StringT	RO	V1.1	
24 (0x18)	0	Application Specific Tag	StringT	RW	***	

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System command

Index (hex)	Subindex	Name	Data type	Access	Value range
2 (0x02)	0	System-Command	UIntegerT 8	WO	130 (0x82) : Restore factory settings
12 (0x6E)	0	Device Access Locks	UIntegerT 16 (upper byte unused)	RW	Byte 0 Bit 0: parameter write protection 0: Parameters modification permitted 1: Parameters modification is locked Bit 1: data storage into the non-volatile memory. 0: Data storage modification permitted 1: Data storage modification is locked Byte 1 : unused

Diagnosis parameters

Index (hex)	Subindex	Name	Data type	Access	Value range	Comment
110 (0x6E)	0	Operating hours	UIntegerT 32	RO	0 to 4294967295	

Sensata specific parameters, Observer and Maintenance access

Index	Subindex	Name	Data type	Access	Value range	Comment
64 (0x40)	0	set Zero Point	Button	WO		Set zero point
65 (0x41)	0	set Preset	Button	WO		Set Preset
66 (0x42)	0	Rotation direction	BooleanT	RW	false : CW true : CCW	Set the rotation direction
67 (0x43)	0	Preset value singleturn	UInteger14	RW	0 to 4095	Preset for the position inside the turn
68 (0x44)	0	Preset value multiturn	UIntegerT16	RW	0 to 65535	Preset for the number of turns
80 (0x50)	0	Singleturn Resolution	UIntegerT14	RW	1 to 12	Resolution for the position in a turn (in bits)
81 (0x51)	0	Multiturn Resolution	UIntegerT16	RW	1 to 16	Resolution of the turn counter (in bits)

Sensata specific parameters, Specialist access

Index	Subindex	Name	Data type	Access	Value range	Comment
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	Factory Setting	Comment
Rotation direction	false : CW	Set the rotation direction
Preset value singleturn	0	Preset for the position inside the turn
Preset value multiturn	0	Preset for the number of turns
Singleturn Resolution	12	Resolution for the position in a turn (in bits)
Multiturn Resolution	16	Resolution of the turn counter (in bits)
Operating-hours	0	Number of hours with device on
Absolute position error flag	false	Process data flag
Magnetic field issue flag	false	Process data flag

Events

Code	Name	Type	Description
16912 (0x4210)	Device temperature over-run	Warning	Temperature above limits
16912 (0x5012)	Battery low	Warning	Device needs to be replaced, the multi-turn position will be lost when power is off…
6145 (0x1801)	Off-power multi-turn counter desynchronized with running multi-turn counter	Warning	Device off-power MT counter is desynchronized with running MT. Set Zero or set Preset needs to be done
36350 (0x8DFE)	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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