

# Documentation IO-Link

## Product: TSD-30

### 1. Description of the IO-Link functionality

IO-Link is a point-to-point connection for the communication of the TSD-30 with an IO-Link master.

### 2. Physical layer

The TSD-30 supports the following features:

- IO-Link specification: Version 1.1
- SIO mode: Yes
- Minimum cycle time: 3,0 ms
- Rate: COM2 (38,4 kBaud)
- Process data length: 16 bit (Frametype 2.2)
- Support of data storage: Yes

### 3. Process Data

The TSD-30 has 1 or 2 digital outputs. Both switching outputs are transmitted as process data via IO-Link.

In the 'SIO Mode' (Standard I/O Mode), i.e. no IO-Link operation, the switching output 1 will switch on pin 4 of the M12 connector.

In the IO-Link communication mode, this pin is reserved exclusively for communication. Switching output 2 is always switched additionally on pin 2 of the M12 connector.

With a Frametype 2.2, the 16-bit process data from the temperature switch are transmitted cyclically. Bit 0 is the state of switching output 1 and Bit 1 is the state of switching output 2, where 1 respectively DC 24 V correspond to the "closed" logic state of the respective output.

The remaining 14 bits contain the analogue value measured by the temperature switch. The start of the measuring range (MBA) corresponds to a value of 1,000 d and the end of the measuring range (MBE) corresponds to a value of 9,000 d.

Bit	Process value	Value range
0	OU1	0 = off, 1 = on
1	OU2	0 = off, 1 = on
2 .. 15	Measured value (UInt)	1000 d = MBA; 9000 d = MBE

#### 4. Service data (ISDU – Indexed Service Data Unit)

Service data is always acyclic and exchanged on the request of the IO-Link Master

With the help of the service data, the following parameter values or instrument status can be read:

##### IO-Link specific

Index dez (hex)	Name	Format	Length	Access	Default value	Value / Range	Remarks
16 (0x10)	Vendor Name	String	64 Byte	R	WIKA Alexander Wiegand SE & Co. KG		
17 (0x11)	Vendor Text	String	64 Byte	R	<a href="http://www.wika.com">www.wika.com</a>		
18 (0x12)	Product Name	String	64 Byte	R	TSD-30 1Q or TSD-30 2Q		
19 (0x13)	Product ID	String	64 Byte	R	02166784 or 02232320		
21 (0x15)	Serial Number	String	16 Byte	R	S#		Corresponds to serial number on the product label (S#).
24 (0x18)	TAG	String	16 Byte	R/W	-		Customer-specific measuring point number
36 (0x24)	Device Status	UInt	8 Bit	R	-	0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure	

**WIKAI specific**

Index dez (hex)	Name	Format	Length	Access	Default value	Value / Range	Remarks
65 (0x41)	SP1 or FH1	UInt	16 Bit	R/W	9000	1040...9000	Switching point/window High switching output 1
66 (0x42)	RP1 or FL1	UInt	16 Bit	R/W	8200	1000...8960	Reset point/window Low switching output 1
67 (0x43)	OU1	UInt	8 Bit	R/W	0	0 = HNO = hysteresis function normally open 1 = HNC = hysteresis function normally closed 2 = FNO = window function normally open 3 = FNC = window function normally closed	Switching function Switching output 1
68 (0x44)	SP2 or FH2	UInt	16 Bit	R/W	9000	1040...9000	Switching point/window High switching output 2
69 (0x45)	RP2 or FL2	UInt	16 Bit	R/W	8200	1000...8960	Reset point/window Low switching output 2
70 (0x46)	OU2	UInt	8 Bit	R/W	0	0 = HNO = hysteresis function normally open 1 = HNC = hysteresis function normally closed 2 = FNO = window function normally open 3 = FNC = window function normally closed	Switching function Switching output 2
72 (0x48)	Unit	UInt	8 Bit	R/W	Order-related	0 = Celsius 1 = Fahrenheit	Unit change
73 (0x49)	HIGH	UInt	16 Bit	R	-	0...10000	Max. value memory
74 (0x4A)	LOW	UInt	16 Bit	R	-	0...10000	Min. value memory
75 (0x4B)	DS1	UInt	16 Bit	R/W	0	0...50000 (0...50s)	Switch delay time switching point 1
76 (0x4C)	DR1	UInt	16 Bit	R/W	0	0...50000 (0...50s)	Switch delay time reset point 1
77 (0x4D)	DS2	UInt	16 Bit	R/W	0	0...50000 (0...50s)	Switch delay time switching point 2
78 (0x4E)	DR2	UInt	16 Bit	R/W	0	0...50000 (0...50s)	Switch delay time reset point 2
83 (0x53)	OFS Analogue signal	Float	4 Byte	R/W	0.0	±3% of span	Offset shift
240 (0xF0)	MBA	Float	4 Byte	R/W	Order-related	The temperature value is always linearised such that the MBA equals the value 1000 and the MBE equals the value 9000.	
241 (0xF1)	MBE	Float	4 Byte	R/W	Order-related	The temperature value is always linearised such that the MBA equals the value 1000 and the MBE equals the value 9000.	
242 (0xF2)	Temperature	Int	16 Bit	R	-	0...10000	Actual temperature
243 (0xF3)	Order Number	String	10 Byte	R	P#	Corresponds to article number on the product label (P#).	
250 (0xFA)	Display Rotation	UInt	8 Bit	R/W	0 = Standard 1 = 180°C rotated	Turn display indicator by 180°	

Index dez (hex)	Name	Format	Length	Access	Default value	Value / Range	Remarks
251 (0xFB)	Display Mode	UInt	8 Bit	R/W	0	0 = Act 1 = HIGH 2 = LOW 3 = SP1/FH1 4 = RP1/FL1 5 = SP2/FH2 6 = RP2/FL2 7 = Off	Display value in display mode
252 (0xFC)	Display Password	UInt	16 Bit	R/W	-	0...9999	Enter password in order to set the parameters at the instrument. Password 0 = no password

### System commands

Index dez (hex)	Name	Format	Length	Value	Remarks
2 (0x02)	RES	UInt	1 Byte	130	Return the set parameter to the factory settings
2 (0x02)	LOCK	UInt	1 Byte	163	General keylock On
2 (0x02)	UNLOCK	UInt	1 Byte	164	General keylock Off
2 (0x02)	RHL	UInt	1 Byte	176	Clear the Min- and Max-value memories