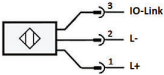



IO-Link Interface Description

ThinkTop V50 IO-Link



<p>ThinkTop V50 IO-Link</p> <p>Valve Control Unit</p>		
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Vendor ID	1292 / Bytes 5-12 (hex: 05-0C)
Device ID	9 / Bytes 0-9 (hex: 00-09)
Bit rate	COM2
Minimum cycle time	5 ms
SIO mode supported	No
Block parameterization	Yes
Data storage	Yes
Supported profiles	BLOB, Binary Large Objects Identification and Diagnosis
Supported Control Board revision	AE or newer



NOTE:

- If the Vendor ID and Device ID is referenced in your PLC system, then it is ensured that
- the connected Device type is correct
 - the IO-Link datastorage is enabled
 - your application is still able to work, even your Device has been exchanged with a successor model.



For process value update rate, as well as further information concerning sensor performance, see datasheet

2 processdata

Process data input		RecordT (32 Bit)
Valve position		IntegerT (16 Bit)
Current valve position. Represents the actual distance between the top of the valve actuator and the top of the valve stem.		
Value range [mm]	(0 to 720) * 0.1 32764	(NoData) 0x7FFC
Error status		UIntegerT (6 Bit)
Short description of the current error (Troubleshooting advice is available in the Instruction manual)		
Value range	0	(Everything is OK)
	16	(Sensor target missing (#16))
	17	(Setup prerequisite issue (#17))
	18	(Pneumatic part issue (#18))
	19	(Seat lift sensor issue (#19))
	20	(Position not reached (#20))
	21	(Unexpected movement (#21))
	22	(Seat-lift sensor missing (#22))
	23	(Pilot valve 1 missing (#23))
	24	(Pilot valve 2 missing (#24))
	25	(Pilot valve 3 missing (#25))
	26	(Interlock active (#26))
	27	(Output short circuit (#27))
	28	(Setup aborted (#28))
	29	(Blocked button (#29))
	30	(Communication failure (#30))
	31	(Safety stop active (#31))
Valve State		BooleanT
Current Valve state (The valve system is OK when the signal is high)		
Value range	false	(Valve state NOT OK)
	true	(Valve state OK)
MAIN		BooleanT
Main energised Position		
Value range	false	(inactive)
	true	(active)
DE_EN		BooleanT
De-Energized		
Value range	false	(inactive)
	true	(active)

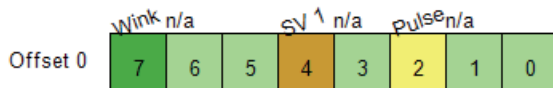


Process data displayed according device sort order.
Please note: Siemens PLCs swap the high and low byte when using byte addressing.



2 processdata

Process data output		RecordT (8 Bit)
Pulse		BooleanT
Trigger one clean pulse on SV 1 (The pulse stroke length can be customised)		
Value range	false true	(Disable) (Enable)
SV 1		BooleanT
Trigger solenoid valve 1 for main valve activation		
Value range	false true	(Disable) (Enable)
Wink		BooleanT
Visual indication for locating the unit (Purple flashing as default)		
Value range	false true	(Disable) (Enable)



-n/a: Not available area. Used to cover structured process data mapping

-n/a: Not available area. Used to cover structured process data mapping

3 Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
Device Access Locks	12		RecordT (16 Bit)	false (Unlocked)	9
Vendor name	16		StringT (10 Byte)	Alfa Laval	8
Vendor text	17		StringT (17 Byte)	www.alfalaval.com	8
Product Name	18		StringT (20 Byte)	ThinkTop V50 IO-Link	8
Product ID	19		StringT (20 Byte)	ThinkTop V50 IO-Link	8
Product Text	20		StringT (31 Byte)	Control board SP no. 9615395201	8
Serial Number	21		StringT (16 Byte)		8
Hardware Revision	22		StringT (2 Byte)		12
Firmware Revision	23		StringT (16 Byte)		12
Application-specific Tag	24		StringT (32 Byte)	***	8
Function Tag	25		StringT (32 Byte)	***	8
Location Tag	26		StringT (32 Byte)	***	8
Process data input	40		RecordT (32 Bit)		
Process data output	41		RecordT (8 Bit)		
BLOB ID	49		IntegerT (16 Bit)	0 (Idle)	14
Production date	65		StringT (4 Byte)		12
Valve Type	66		UIntegerT (8 Bit)		9
Setup Type	67		UIntegerT (8 Bit)		9
Error Modifier	70		IntegerT (8 Bit)	10	9
Power Save	73		UIntegerT (8 Bit)	0 (Disabled)	9
RGB-Colour	74		RecordT (64 Bit)		10
Button press	74	1	UIntegerT (8 Bit)	5 (Purple)	
Error	74	2	UIntegerT (8 Bit)	4 (Red)	
Out	74	3	UIntegerT (8 Bit)	0 (RGB off)	
De-En	74	4	UIntegerT (8 Bit)	2 (Green)	
Main	74	5	UIntegerT (8 Bit)	7 (White)	
Wink	74	8	UIntegerT (8 Bit)	5 (Purple)	
Key Lock	76		UIntegerT (8 Bit)	0 (Unlocked)	10
Seat valve pulse	78		RecordT (32 Bit)		11
De-En	78	1	IntegerT (16 Bit)	2	
Main	78	2	IntegerT (16 Bit)	2	
Rotary valve pulse	79		RecordT (32 Bit)		11
De-En	79	1	IntegerT (16 Bit)	30	
Main	79	2	IntegerT (16 Bit)	30	
Log	80		RecordT (96 Bit)		12
PowerUps	80	1	IntegerT (32 Bit)		
RunTime	80	2	IntegerT (32 Bit)		
LastCustomisation	80	3	IntegerT (32 Bit)		
Temperature	81		RecordT (48 Bit)		12
Current	81	1	IntegerT (16 Bit)		
Min	81	2	IntegerT (16 Bit)		
Max	81	3	IntegerT (16 Bit)		
Pressure Shock Counter	82		IntegerT (32 Bit)	0	12
SV-activations	83		RecordT (96 Bit)		12
SV1	83	1	IntegerT (32 Bit)	0	

3 Parameter overview

Parameter	Index	Subindex	Type	Factory setting	page
SV-ON_time	84		RecordT (96 Bit)		13
SV1	84	1	IntegerT (32 Bit)	0	
Setup En-stroke	85		RecordT (96 Bit)		13
SV1 (main)	85	1	IntegerT (32 Bit)	0	
Setup DeEn-stroke	86		RecordT (96 Bit)		14
SV1	86	1	IntegerT (32 Bit)	0	
Setup Position Data (De...)	110		RecordT (32 Bit)		13
Pos De-En	110	1	UIntegerT (16 Bit)		
Switchpoint logic	110	2	BooleanT		
Switchpoint hystere...	110	3	UIntegerT (8 Bit)		
Setup Position Data (Ma...)	111		RecordT (48 Bit)		13
Pos Main	111	1	UIntegerT (16 Bit)		
Switchpoint logic	111	2	BooleanT		
Switchpoint hystere...	111	3	UIntegerT (8 Bit)		

4 System Commands



System Command information
 - Address: Index 2, Subindex 0
 - Datatype: UInteger (8 Bit)
 - AccessRight: Write Only

System	Text	Description
1	Upload Start	Start block parameter upload
2	Upload End	End block parameter upload
3	Download Start	Start block parameter download
4	Download End	Stop block parameter download
5	Store	Finalize block parameterization and start Data Storage
6	Break	Cancel block parameterization
130	Restore Factory Settings	
208	Start Auto Setup	
209	Setup Reset	
210	Parameter Reset	
211	Diagnostic Reset	
240	IO-Link 1.1 system test command 240, Event 8DFE appears	
241	IO-Link 1.1 system test command 241, Event 8DFE disappears	
242	IO-Link 1.1 system test command 242, Event 8DFF appears	
243	IO-Link 1.1 system test command 243, Event 8DFF disappears	



5 Identification

Vendor name	Index 16	Subindex 0	StringT (10 Byte)	ReadOnly
The vendor name that is assigned to a Vendor ID.				
Factory setting	Alfa Laval			
Vendor text	Index 17	Subindex 0	StringT (17 Byte)	ReadOnly
Additional information about the vendor.				
Factory setting	www.alfalaval.com			
Product Name	Index 18	Subindex 0	StringT (20 Byte)	ReadOnly
Complete product name.				
Factory setting	ThinkTop V50 IO-Link			
Product ID	Index 19	Subindex 0	StringT (20 Byte)	ReadOnly
Vendor-specific product or type identification (e.g., item number or model number).				
Factory setting	ThinkTop V50 IO-Link			
Product Text	Index 20	Subindex 0	StringT (31 Byte)	ReadOnly
Additional product information for the device.				
Factory setting	Control board SP no. 9615395201			
Serial Number	Index 21	Subindex 0	StringT (16 Byte)	ReadOnly
Unique, vendor-specific identifier of the individual device.				
Application-specific Tag	Index 24	Subindex 0	StringT (32 Byte)	ReadWrite
Possibility to mark a device with user- or application-specific information.				
Factory setting	***			
Function Tag	Index 25	Subindex 0	StringT (32 Byte)	ReadWrite
Description of the device function				
Factory setting	***			
Location Tag	Index 26	Subindex 0	StringT (32 Byte)	ReadWrite
Description of the physical device location				
Factory setting	***			

6 Parameter

Device Access Locks	Index 12	Subindex 0	RecordT (16 Bit)	ReadWrite
The access to the device parameters can be restricted by setting appropriate flags within this parameter.				
Factory setting Value range	false true	(Unlocked) (Locked)		
Factory setting Value range	false true	(Unlocked) (Locked)		
	false	(Unlocked)		



- bitOffset 1 Data Storage / This lock prevents the write access to the device parameters via the data storage mechanism.
- bitOffset 2 Local Parameterization / This lock prevents the device settings from being changed via local operating elements on the device.

Valve Type	Index 66	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Detected or configured valve type				
Value range	0 1	(Rotary valve) (Seat valve)		

Setup Type	Index 67	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Type of current setup				
Value range	0 1 2 3	(No Setup) (Auto Setup) (Live Setup) (Flex Setup)		

Error Modifier	Index 70	Subindex 0	IntegerT (8 Bit)	ReadWrite
The 'position not reached' timeout of the surveillance mode feature is calculated by [stroke duration + error modifier], the error modifier can be modified				
Factory setting Value range	10 (1 to 60) [s]			

Power Save	Index 73	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Power save mode will turn off the visual indication when the unit is idle				
Factory setting Value range	0 0 1	(Disabled) (Disabled) (Enabled)		

RGB-Colour	Index 74	Subindex 0	RecordT (64 Bit)	ReadWrite
Option for customisation of the colours for the visual feedback				
Button press		Subindex 1	UIntegerT (8 Bit)	
RGB colour for button press feedback				
Factory setting Value range	5 0 1 2 3 4 5 6 7	(Purple) (RGB off) (Blue) (Green) (Cyan) (Red) (Purple) (Yellow) (White)		



6 Parameter

Error		Subindex 2	UIntegerT (8 Bit)
RGB colour for error feedback			
Factory setting	4	(Red)	
Value range	0	(RGB off)	
	1	(Blue)	
	2	(Green)	
	3	(Cyan)	
	4	(Red)	
	5	(Purple)	
	6	(Yellow)	
	7	(White)	

Out		Subindex 3	UIntegerT (8 Bit)
RGB colour for Moving (out of any position)			
Factory setting	0	(RGB off)	
Value range	0	(RGB off)	
	1	(Blue)	
	2	(Green)	
	3	(Cyan)	
	4	(Red)	
	5	(Purple)	
	6	(Yellow)	
	7	(White)	

De-En		Subindex 4	UIntegerT (8 Bit)
RGB colour for De-Energized position			
Factory setting	2	(Green)	
Value range	0	(RGB off)	
	1	(Blue)	
	2	(Green)	
	3	(Cyan)	
	4	(Red)	
	5	(Purple)	
	6	(Yellow)	
	7	(White)	

Main		Subindex 5	UIntegerT (8 Bit)
RGB colour for Main position			
Factory setting	7	(White)	
Value range	0	(RGB off)	
	1	(Blue)	
	2	(Green)	
	3	(Cyan)	
	4	(Red)	
	5	(Purple)	
	6	(Yellow)	
	7	(White)	

Wink		Subindex 8	UIntegerT (8 Bit)
RGB colour for Wink signal			
Factory setting	5	(Purple)	
Value range	0	(RGB off)	
	1	(Blue)	
	2	(Green)	
	3	(Cyan)	
	4	(Red)	
	5	(Purple)	
	6	(Yellow)	
	7	(White)	

Key Lock	Index 76	Subindex 0	UIntegerT (8 Bit)	ReadWrite
Locks the SELECT key on the local user interface to prevent unintentional changes, [Key Lock] is reset-table at the device.				
Factory setting	0	(Unlocked)		
Value range	0	(Unlocked)		
	1	(Locked)		

Seat valve pulse	Index 78	Subindex 0	RecordT (32 Bit)	ReadWrite
Pulse stroke distances of seat valve cleaning				



6 Parameter

De-En	Subindex 1	IntegerT (16 Bit)		
Pulse clean. Sets the travel distance of the seat during a pulse from De-En position.				
Factory setting	2			
Value range [mm]	(1 to 100) * 1			
Main	Subindex 2	IntegerT (16 Bit)		
Pulse clean. Sets the travel distance of the seat during a pulse from Main-En position.				
Factory setting	2			
Value range [mm]	(1 to 100) * 1			
Rotary valve pulse	Index 79	Subindex 0	RecordT (32 Bit)	ReadWrite
Pulse stroke distances of rotary valve cleaning				
De-En	Subindex 1	IntegerT (16 Bit)		
Pulse clean. Sets the travel distance of the stem during a pulse from De-En position. Note: The relation between the stem movement and disc angle is not linear in a LKLA.				
Factory setting	30			
Value range [mm]	(1 to 100) * 1			
Main	Subindex 2	IntegerT (16 Bit)		
Pulse clean. Sets the travel distance of the stem during a pulse from Main-En position. Note: The relation between the stem movement and disc angle is not linear in a LKLA.				
Factory setting	30			
Value range [mm]	(1 to 100) * 1			



7 Diagnosis

Production date	Index 65	Subindex 0	StringT (4 Byte)	ReadOnly
Device production date (YYWW)				
Hardware Revision	Index 22	Subindex 0	StringT (2 Byte)	ReadOnly
Unique, vendor-specific identifier of the hardware revision of the individual device.				
Firmware Revision	Index 23	Subindex 0	StringT (16 Byte)	ReadOnly
Unique, vendor-specific identifier of the firmware revision of the individual device.				
Log	Index 80	Subindex 0	RecordT (96 Bit)	ReadOnly
Logging information				
PowerUps		Subindex 1	IntegerT (32 Bit)	
Number of power-cycles				
Value range	(0 to 2000000) * 1			
RunTime		Subindex 2	IntegerT (32 Bit)	
Number of operating hours				
Value range [h]	(0 to 2000000) * 1			
LastCustomisation		Subindex 3	IntegerT (32 Bit)	
Time since last tool parametrisation				
Value range [h]	(0 to 2000000) * 1			
Temperature	Index 81	Subindex 0	RecordT (48 Bit)	ReadOnly
Temperature monitoring				
Current		Subindex 1	IntegerT (16 Bit)	
Current core temperature				
Value range [°C]	(-20 to 100) * 1			
Min		Subindex 2	IntegerT (16 Bit)	
Minimum core temperature to date				
Value range [°C]	(-20 to 100) * 1			
Max		Subindex 3	IntegerT (16 Bit)	
Maximum core temperature to date				
Value range [°C]	(-20 to 100) * 1			
Pressure Shock Counter	Index 82	Subindex 0	IntegerT (32 Bit)	ReadOnly
Small unexpected valve movements (0.2 - 4.0mm movement within 0.5s, Event #32)				
Factory setting	0			
Value range	(0 to 2000000)			
SV-activations	Index 83	Subindex 0	RecordT (96 Bit)	ReadOnly
Number of solenoid valve activations				
SV1		Subindex 1	IntegerT (32 Bit)	
Number of SV 1 activations				
Factory setting	0			
Value range	(0 to 2000000) * 1			
SV-ON_time	Index 84	Subindex 0	RecordT (96 Bit)	ReadOnly
Total ON time of solenoid valves				



7 Diagnosis

SV1		Subindex 1	IntegerT (32 Bit)	
Total ON time of SV 1				
Factory setting	0			
Value range [min]	(0 to 2000000) * 1			
Setup Type	Index 67	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Type of current setup				
Value range	0	(No Setup)		
	1	(Auto Setup)		
	2	(Live Setup)		
	3	(Flex Setup)		
Valve Type	Index 66	Subindex 0	UIntegerT (8 Bit)	ReadOnly
Detected or configured valve type				
Value range	0	(Rotary valve)		
	1	(Seat valve)		
Setup Position Data (DeEn)	Index 110	Subindex 0	RecordT (32 Bit)	ReadOnly
Data for position in current setup				
Pos De-En		Subindex 1	UIntegerT (16 Bit)	
Target switchpoint (De-Energize)				
Value range [mm]	(0 to 720) * 0.1 32764	(NoData) 0x7FFC		
Switchpoint logic				
Value range	0	(High active)		
	1	(Low active)		
Switchpoint hysteresis				
Value range	3		UIntegerT (8 Bit)	
Setup Position Data (Main)	Index 111	Subindex 0	RecordT (48 Bit)	ReadOnly
Data for position in current setup				
Pos Main		Subindex 1	UIntegerT (16 Bit)	
Target switchpoint (Main)				
Value range [mm]	(0 to 720) * 0.1 32764	(NoData) 0x7FFC		
Switchpoint logic				
Value range	0	(High active)		
	1	(Low active)		
Switchpoint hysteresis				
Value range	3		UIntegerT (8 Bit)	
Setup En-stroke	Index 85	Subindex 0	RecordT (96 Bit)	ReadOnly
The stroke durations per solenoid valve (energizing direction)				
SV1 (main)		Subindex 1	IntegerT (32 Bit)	
Stroke duration, SV 1 (energizing)				
Factory setting	0			
Value range [ms]	(0 to 100000) * 1			
Setup DeEn-stroke	Index 86	Subindex 0	RecordT (96 Bit)	ReadOnly
The setup stroke durations pr solenoid valve (de-energizing direction)				



7 Diagnosis

SV1	Subindex 1	IntegerT (32 Bit)
Stroke duration, SV 1 (de-energize)		
Factory setting	0	
Value range [ms]	(0 to 100000) * 1	

BLOB ID	Index 49	Subindex 0	IntegerT (16 Bit)	ReadOnly
The durations of the latest strokes and the latest events can be exported as data files				
Factory setting	0	(Idle)		
Value range	0	(Idle)		
	-4096	(Diagnostic log)		
	-4099	(Stroke durations)		

8 Events

Code	Device status	PQ*	Class	Name	Description
0x4210 16912d	2 (Out of specification)	valid	Warning	Device temperature overrun	Clear source of heat
0x4220 16928d	2 (Out of specification)	valid	Warning	Device temperature underrun	Insulate device
0x5010 20496d	3 (Functional check)	valid	Error	Component malfunction	Repair or exchange
0x5111 20753d	2 (Out of specification)	valid	Warning	Primary supply voltage underrun	Check valid voltage range
0x8DFE 36350d	1 (Maintenance required)	valid	Warning	Test Event 1	Event appears by setting index 2 to value 240, Event disappears by setting index 2 to value 241
0x8DFF 36351d	1 (Maintenance required)	valid	Warning	Test Event 2	Event appears by setting index 2 to value 242, Event disappears by setting index 2 to value 243



Events are raised by the device itself to notify irregular device states
PQ* = Process data quality

9 Error types

Code	Name	Description
0x8000 32768d	Device application error - no details	Service was denied by the technology-specific application. No detailed root-cause information is available.
0x8011 32785d	Index not available	Read or write access attempt to a non-existing index.
0x8012 32786d	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
0x8020 32800d	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
0x8023 32803d	Access denied	Write access to a read-only parameter or read access to write-only parameter.
0x8030 32816d	Parameter value out of range	Written parameter value is outside of the permitted value range.
0x8033 32819d	Parameter length overrun	Written parameter is longer than specified.
0x8034 32820d	Parameter length underrun	Written parameter is shorter than specified.
0x8035 32821d	Function unavailable	Written command is not supported by the technology-specific application
0x8036 32822d	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
0x8040 32832d	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
0x8041 32833d	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.
0x8082 32898d	Application not ready	Read or write access denied. The technology-specific application is temporarily unavailable.



Error types are used for the ISDU response. Values unequal '0' indicate the cause of a failed ISDU read or write service.