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IO-Link Implementation		
Vendor ID		234 (0x00EA)
Device ID	VSi V	100610 (0x018902)
	VSi P10	100611 (0x018903)
	VSi VP8	100613 (0x018905)
SIO-Mode		Yes
IO-Link Revision		1.1 (compatible with 1.0)
IO-Link Profile		Smart Sensor Profile with 2 Binary Data Channels, 1 Process Data Variable, Teach-In and Diagnosis
IO-Link Bitrate		38.4 kBit/sec (COM2)
Minimum Cycle Time		2.3 ms
Process Data Input		2 bytes
Process Data Output		None

Process Data						
Process Data Input	Name	Bits	Data Type	Access	Special Values	Remark
PD In Byte 0	Vacuum in mbar, MSB	7...0	VSi V: 14-bit unsigned integer VSi P10: 14-bit unsigned integer VSi VP8: 14-bit signed integer	ro	VSi V: 10000 = Overflow, 16383 = Underflow (pressure) VSi P10: 10000 = Overflow, 16383 = Underflow (vacuum) VSi VP8: 8191 = Overflow P, -8192 = Overflow V	Most significant 8 bits of sensor measurement value (mbar)
PD In Byte 1	Vacuum in mbar, LSB	7...2				Least significant 6 bits of sensor measurement value (mbar)
	Switching Point 2	1	Boolean	ro		Logic state of switch point 2
	Switching Point 1	0	Boolean	ro		Logic state of switch point 1

ISDU Parameters									
ISDU Index dec	hex	Subindex dec	Display Appearance	Parameter	Size	Value Range	Access	Default Value	Remark
Identification									
Device Management									
16	0x0010	0		Vendor Name	1...32 bytes		ro	J. Schmalz GmbH	Manufacturer designation
17	0x0011	0		Vendor Text	1...32 bytes		ro	www.schmalz.com	Internet address
18	0x0012	0		Product Name	1...32 bytes		ro	VSi / VSi-D	General product name
19	0x0013	0		Product ID	1...32 bytes		ro	VSi / VSi-D	Product variant name
20	0x0014	0		Product Text	1...32 bytes		ro	VSi V M12-4	Order-code
21	0x0015	0	Snr	Serial Number	9 bytes		ro	000000001	Serial number
22	0x0016	0		Hardware Revision	2 bytes		ro	00	Hardware revision
23	0x0017	0	SoC	Firmware Revision	4 bytes		ro	1.11	Firmware revision
240	0x00F0	0		Unique ID	20 bytes		ro		Unique device identification number
241	0x00F1	0		Device Features	11 bytes		ro		Type code of device features (see IODD)
250	0x00FA	0	Art	Article Number	14 bytes		ro	10.06.02.*	Order-number
251	0x00FB	0		Article Revision	2 bytes		ro	00	Article revision
252	0x00FC	0		Production Date	3 bytes		ro		Date code of production (month, year)
254	0x00FE	0		Detailed Product Text	1...64 bytes		ro	VSi V M12-4	Detailed type description of the device
Device Localization									
24	0x0018	0		Application Specific Tag	1...32 bytes		rw	***	User string to store location or tooling information
242	0x00F2	0		Equipment Identification	1...64 bytes		rw	***	User string to store identification name from schematic
246	0x00F6	0		Geolocation	1...64 bytes		rw	***	User string to store geolocation from handheld device
247	0x00F7	0		IODD Web Link	1...64 bytes		rw	***	User string to store web link to IODD file
248	0x00F8	0		NFC Web Link	1...64 bytes		rw	https://myproduct.schmalz.com/#/	Web link to NFC app (base URL for NFC tag)
249	0x00F9	0		Storage Location	1...32 bytes		rw	***	User string to store storage location
253	0x00FD	0		Installation Date	1...16 bytes		rw	***	User string to store date of installation
Parameter									
Device Settings									
Commands									
2	0x0002	0		System Command	1 byte	5, 65, 130, 165, 66, 167, 168, 169	wo		0x05 (dec 5): Force upload of parameter data into the master 0x41 (dec 65): Execute single-value teach for currently selected SPx 0x82 (dec 130): Restore device parameters to factory defaults 0xA5 (dec 165): Calibrate sensor 0xA7 (dec 167): Reset erasable counters ct1 and ct2 0xA8 (dec 168): Reset voltage HI/LO 0xA9 (dec 169): Reset sensor HI/LO
58	0x003A	0		Teach-In Channel	1 byte	1, 2	rw		Select switch point 1 or 2 for teaching
59	0x003B	0		Teach-In Status	1 byte		ro		Result of last teach-in command: 0x00 = Channel changed 0x07 = Teach-in failed 0x11 = Teach-in successful
Access Control									
12	0x000C	0		Device Access Locks	2 bytes	0 - 7	rw	0	Bit 0: Parameter access lock (lock ISDU-write access) Bit 1: Data storage lock Bit 2: Local parameterization lock (lock menu editing)
90	0x005A	0		Extended Device Access Locks	1 byte	0 - 3	rw	0	Bit 0: NFC write lock Bit 1: NFC disable
77	0x004D	0	Pin	Menu PIN code	2 bytes	0 - 999	rw	0	0 = Menu editing unlocked >0 = Menu editing locked with pin-code
91	0x005B	0		NFC PIN code	2 bytes	0 - 999	rw	0	Pass code for writing data from NFC app
Initial Settings									
73	0x0049	0	P-n	Signal Type	1 byte	0 - 1	rw	0	0 = PNP 1 = NPN
74	0x004A	0	uni	Display Unit	1 byte	0 - 3	rw	0	0 = mbar 1 = kPa 2 = inHg 3 = psi
76	0x004C	0	Eco	Eco-Mode	1 byte	0 - 2	rw	0	0 = off 1 = on (full eco mode with display switching off completely) 2 = Lo (medium eco mode with display dimmed to 50%)
79	0x004F	0	diS	Display Rotation	1 byte	0 - 1	rw	0	0 = Standard 1 = Rotated
Process Settings									
Switch Point 1									
60	0x003C	1	SP1/FH1	Switch Point 1 - Upper Threshold	2 bytes		rw		Unit mbar
60	0x003C	2	rP1/FL1	Switch Point 1 - Lower Threshold	2 bytes		rw		Unit mbar
61	0x003D	1	Ou1	Switch Point 1 - Logic	1 byte	0 - 1	rw	0	0 = NO 1 = NC
61	0x003D	2	Ou1	Switch Point 1 - Mode	1 byte	2, 3, 128, 129	rw	3	2 = Window Mode 3 = Two-Point Mode 128 = Condition Monitoring (not for VSi P10) 129 = Diagnostic Mode
61	0x003D	3	Hy1	Switch Point 1 - Window Hysteresis	2 bytes		rw		Unit mbar
75	0x004B	1	dS1	Switch Point 1 - Switch-on delay	2 bytes	0 - 999	rw		Unit ms
75	0x004B	2	dr1	Switch Point 1 - Switch-off delay	2 bytes	0 - 999	rw		Unit ms
Switch Point 2									
62	0x003E	1	SP2/FH2	Switch Point 2 - Upper Threshold	2 bytes		rw		Unit mbar
62	0x003E	2	rP2/FL2	Switch Point 2 - Lower Threshold	2 bytes		rw		Unit mbar
63	0x003F	1	Ou2	Switch Point 2 - Logic	1 byte	0 - 1	rw	0	0 = NO 1 = NC



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63	0x003F	2	Ou2	Switch Point 2 - Mode	1 byte	2, 3, 128, 129	rw	3	2 = Window Mode 3 = Two-Point Mode 128 = Condition Monitoring (not for VSi P10) 129 = Diagnostic Mode
63	0x003F	3	Hy2	Switch Point 2 - Window Hysteresis	2 bytes		rw		Unit mbar
80	0x0050	1	dS2	Switch Point 2 - Switch-on delay	2 bytes	0 - 999	rw		Unit ms
80	0x0050	2	dr2	Switch Point 2 - Switch-off delay	2 bytes	0 - 999	rw		Unit ms
Condition Monitoring [CM]									
108	0x006C	0	-L-	Permissible Leakage Rate	2 bytes	0 - 999	rw		Unit mbar/sec
Observation									
Monitoring									
Process Data									
40	0x0028	0		Process Data In Copy	2 bytes		ro		Copy of currently active process data input
64	0x0040	1		Sensor Value	2 bytes		ro		Actual sensor value
64	0x0040	2		Sensor Value LO	2 bytes		ro		Lowest measured sensor value since power-up
64	0x0040	3		Sensor Value HI	2 bytes		ro		Highest measured sensor value since power-up
66	0x0042	1		Supply Voltage	2 bytes		ro		Supply voltage as measured by the device (unit: 0.1 Volt)
66	0x0042	2		Supply Voltage LO	2 bytes		ro		Lowest measured supply voltage since power-up
66	0x0042	3		Supply Voltage HI	2 bytes		ro		Highest measured supply voltage since power-up
Communication Mode									
564	0x0234	0		Communication Mode	1 byte		ro		0x00 = SIO mode 0x10 = IO-Link revision 1.0 (set by master) 0x11 = IO-Link revision 1.1 (set by master)
Counters									
140	0x008C	0	cc1	Counter cc1	4 bytes		ro		Switch-on counter for switch point 1 (non-erasable)
141	0x008D	0	cc2	Counter cc2	4 bytes		ro		Switch-on counter for switch point 2 (non-erasable)
143	0x008F	0	ct1	Counter ct1	4 bytes		ro		Switch-on counter for switch point 1 (erasable)
144	0x0090	0	ct2	Counter ct2	4 bytes		ro		Switch-on counter for switch point 2 (erasable)
Diagnosis									
Device Status									
32	0x0020	0		Error Count	2 bytes		ro		Number of errors since last power-up
36	0x0024	0		IO-Link Device Status	1 byte		ro		0 = Device is operating properly 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure
37	0x0025	1-15		Detailed Device Status	15 x 3 bytes		ro		Information about currently pending events Fixed-length array format according to IO-Link specification V1.1
130	0x0082	0		Active Error Code	1 byte		ro		0 = No error 1-99 = Error code displayed by the device
138	0x008A	1		Extended Device Status - Type	1 byte		ro		Type code of active device status (see below)
138	0x008A	2		Extended Device Status - ID	2 bytes		ro		ID code of active device status (see below)
139	0x008B	1		NFC Status	1 byte		ro		Result of recent NFC activity: 0x00: Data valid, write finished successfully 0x23: Write failed: Write access locked 0x30: Write failed: parameter(s) out of range 0x41: Write failed: parameter set inconsistent 0xA1: Write failed: invalid authorisation 0xA2: NFC not available 0xA3: Write failed: invalid data structure 0xA5: Write pending 0xA6: NFC internal error
Condition Monitoring [CM]									
146	0x0092	0		Condition Monitoring	1 byte		ro		Bit 2: Leakage rate above limit -L- (not for VSi P10) Bit 5: Primary voltage US outside of optimal range
160	0x00A0	0		Actual Leakage Rate	2 bytes		ro		Leakage rate, unit mbar/sec (not for VSi P10)

Parameter ISDU 138 - Extended Device Status				
Type	ID	Type Color	Type Text	Status Text
0x10	0x0000	Green	Everything OK	Everything OK
0x21	0x0002	Yellow	Warning lower	Leakage rate above limit
0x22	0x0007	Yellow	Warning upper	Primary supply voltage US outside of operating range
0x22	0x000A	Yellow	Warning upper	Sensor calibration failed
0x22	0x0017	Yellow	Warning upper	Teach-In failed
0x41	0x000C	Orange	Critical condition lower	Overload OUT1
0x41	0x000D	Orange	Critical condition lower	Overload OUT2
0x41	0x0015	Orange	Critical condition lower	Overtemperature
0x42	0x0010	Orange	Critical condition upper	Primary supply voltage US too low
0x42	0x0011	Orange	Critical condition upper	Primary supply voltage US too high
0x42	0x0016	Orange	Critical condition upper	IO-Link communication interruption
0x81	0x0000	Red	Defect lower	Internal parameter data invalid

Implemented IO-Link Events				
Event code		Event name	Event type	Remark
dec	hex			
4096	0x1000	General malfunction	Error	Error in internal data (E01)
16384	0x4000	Overtemperature	Error	Overtemperature in electronic circuit (E19)
20736	0x5100	General power supply fault	Error	Primary supply voltage US too low (E07)
20752	0x5110	Primary supply voltage over-run	Warning	Primary supply voltage US too high (E17)
30480	0x7710	Short circuit	Error	Overload or short circuit at one or more outputs (E11 and/or E12)
35872	0x8C20	Measurement range over-run	Error	Overflow of sensor value, invalid measurement
6144	0x1800	Calibration OK	Notification	Calibration offset 0 set successfully
6145	0x1801	Calibration failed	Notification	Sensor value too high or too low, offset not changed (E03)
6149	0x1805	Teach-In completed successfully	Notification	New values taught for SPx, rPx or FHx, FLx, hyx
6150	0x1806	Teach-In command failed	Notification	Sensor value over-run, SPx not changed (E20)
6153	0x1809	Leakage rate above limit	Warning	Condition Monitoring: leakage rate above limit
6156	0x180C	Primary supply voltage out of range	Warning	Condition Monitoring: primary supply voltage US outside operating range