

Muster

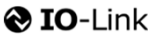
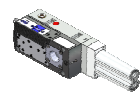
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IO-Link Implementation		
Vendor ID		234 (0x00EA)
Device ID		100248 (0x018798)
SIO-Mode		Yes
IO-Link Revision		1.1
IO-Link Bitrate		38.4 kBit/sec (COM2)
Minimum Cycle Time		3.4 ms
Process Data Input		4 bytes
Process Data Output		2 bytes

Process Data							
Process Data Input	Name	Bits	Data Type	Access	Special Values	Remark	
PD In Byte 0	Signal SP2 (part present)	0	Boolean	ro		Vacuum is over SP2 & not yet under rP2	
	Signal SP1 (air saving function)	1	Boolean	ro		Vacuum is over SP1 & not yet under rP1	
	reserved	2	Boolean	ro		not used	
	CM-Autoset acknowledged	3	Boolean	ro		Acknowledge that the Autoset function has been completed	
	reserved	4	Boolean	ro		Reserved	
	Signal SP3 (part detached)	5	Boolean	ro		The part has been detached after a suction cycle	
	Device status	7 ... 6	2 bit integer	ro		00 - [green] Device is working optimally 01 - [yellow] Device is working but there are warnings 10 - [orange] Device is working but there are severe warnings 11 - [red] Device is not working properly	
PD In Byte 1	Warnings	7...0	8 bit integer	ro		ISDU 146, bits 0-7	
PD In Byte 2	Current vacuum, high-byte	7...0	16 bit integer	ro		Unit: 1mbar	
PD In Byte 3	Current vacuum, low-byte	7...0					
Process Data Out	Name	Bit		Access	Availability	Special Values	Remark
PD Out Byte 0	Vacuum	0	Boolean	wo			Vacuum on/off
	Blow-off	1	Boolean	wo			Activate Blow-off
	Setting Mode	2	Boolean	wo			Vacuum on/off with continuous suction disabled (regardless of dCS parameter)
	CM Autoset	3	Boolean	wo			Perform CM Autoset function (teach permissible leakage and permissible evacuation time)
	Reserved 0	4	Boolean	wo			Reserved
	Reserved 1	5	Boolean	wo			
	Profile-Set 0	6	Boolean	wo			Select Production Profile (2-bit binary coded) (see ISDU parameter areas P0 to P3)
	Profile-Set 1	7	Boolean	wo			
PD Out Byte 1	Input Pressure	7...0	8 bit integer	wo			Pressure value from external sensor (unit: 0.1 bar)

ISDU Parameters										
ISDU Index		Subindex	Display Appearance	Parameter	Size	Value Range	Access	Default Value / Example		Remark
dec	hex	dec								
Identification										
16	0x0010	0		Vendor Name	1...32 bytes		ro	J. Schmalz GmbH	Manufacturer designation	
17	0x0011	0		Vendor Text	1...32 bytes		ro	Beyond Gravity	Vendor text	
18	0x0012	0		Product Name	1...32 bytes		ro	SCPLi	General product name	
19	0x0013	0		Product ID	1...32 bytes		ro	SCPLi	Product variant name	
20	0x0014	0		Product Text	1...32 bytes		ro	SCPLi *	Order-code	
21	0x0015	0	Snr	Serial Number	9 bytes		ro	000000001	Serial number	
22	0x0016	0		Hardware Revision	2 bytes		ro	03	Hardware revision	
23	0x0017	0	SoC	Firmware Revision	4 bytes		ro	0.0D	Firmware revision	
24	0x0018	0		Application specific tag	1...32 bytes		ro/rw	***	User string to store location or tooling information	
25	0x0019	0		Function tag	1...32 bytes		ro/rw	***	User string to store location or tooling information	
26	0x001A	0		Location tag	1...32 bytes		ro/rw	***	User string to store location or tooling information	
17342	0x43BE	0		Hardware Identification Key	16 bytes		ro		Identifies the hardware for compatibility check with the firmware to be installed.	
Device Management										
240	0x00F0	0		Unique ID	9 bytes		ro		Unique device identification number	
248	0x00F8	0		NFC Web Link	1...64 bytes	http://... https://...	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	
250	0x00FA	0	Art	Article Number	14 bytes		ro	10.02.02.*	Order-number	
251	0x00FB	0		Article Revision	2 bytes		ro	00	Article revision	
252	0x00FC	0		Production Date	3 bytes		ro	C19	Date code of production (month+year, month is letter coded, e.g. F18 = July 2018)	
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, 129, 131, 165, 167, 168, 169	wo		0x05 (dec 5): Force upload of parameter data into the master 0x81 (dec 129): Reset application 0x83 (dec 131): Back to box 0xA5 (dec 165): Calibrate vacuum sensor 0xA7 (dec 167): Reset erasable counters ct1, ct2, ct3 0xA8 (dec 168): Reset voltages HI/LO 0xA9 (dec 169): Reset vacuum/pressure HI/LO	
Access Control										
12	0x000C	0		Device Access Locks	2 bytes	0, 4	rw	0	Bit 0-1: reserved Bit 2: Local parameterization lock (lock menu editing) Bit 3-15: reserved	
90	0x005A	0	nFc	Extended Device Access Locks	1 byte		rw	0	Bit 0: NFC write lock Bit 1: NFC disable Bit 2: Not used Bit 3: local user interface locked (manual mode locked) Bit 4: IO-Link event lock (suppress sending IO-Link events) Bit 5-7: Not used	
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	PIN for writing data from NFC app	
Initial Settings										
69	0x0045	0	bLo	Blow-off mode	1 byte	0 - 2	rw	0	0 = Externally controlled blow-off (-E-) 1 = Internally controlled blow-off – time-dependent (-I-) 2 = Externally controlled blow-off – time-dependent (-E-t)	
71	0x0047	0	Ou2	Output 2 function	1 byte	0 - 1	rw	0	0 = NO 1 = NC	
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	
75	0x004B	0	dLY	Output filter	2 byte	0 - 999	rw	10	Unit: 1 ms	
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%)	

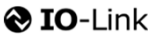
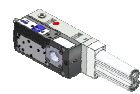


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79	0x004F	0	dIS	Display Rotation	1 byte	0 - 1	rw	0	0 = Standard 1 = Rotated	
⌄ Process Settings										
275	0x0113		P-n	Number of active profile	1 byte		ro		Number of the active profile: 0 - 3	
⌄ Production Setup - Profile P0										
68	0x0044	0	Ctr	Air saving function	1 byte	0 - 2	rw	1	0 = not active (off) 1 = active (on) 2 = active with supervision (onS)	
78	0x004E	0	dCS	Disable continuous suction	1 byte	0 - 1	rw	0	0 = off 1 = on	
100	0x0064	0	SP1	Switch Point 1	2 bytes	999 > SP1 > rP1	rw	750	Unit: 1 mbar	
101	0x0065	0	rP1	Reset Point 1	2 bytes	SP1 > rP1 > SP2	rw	600	Unit: 1 mbar	
102	0x0066	0	SP2	Switch Point 2	2 bytes	rP1 > SP2 > rP2	rw	550	Unit: 1 mbar	
103	0x0067	0	rP2	Reset Point 2	2 bytes	SP2 > rP2 >= 10	rw	540	Unit: 1 mbar	
106	0x006A	0	tbi	Duration automatic blow	2 bytes	10 - 9999	rw	200	Unit: 1 ms	
107	0x006B	0	t-1	Permissible evacuation time	2 bytes	0 - 9999	rw	2000	Unit: 1 ms. No t-1 Warning if set to 0	
108	0x006C	0	-L-	Permissible leakage rate	2 bytes	0 - 999	rw	250	Unit: 1 mbar/sec. No -L- Warning if set to 0	
119	0x0077	0		Profile name	1...32 bytes		rw	***		
⌄ Production Setup - Profile P1										
180	0x00B4	0		Air saving function	1 byte	0 - 2	rw	1	Profile P-1 (selected by PD Out 0 - Profile-Set = 1)	
181	0x00B5	0		Disable continuous suction	1 byte	0 - 1	rw	0		
182	0x00B6	0		Switch Point 1	2 bytes	999 > SP1 > rP1	rw	750		
183	0x00B7	0		Reset Point 1	2 bytes	SP1 > rP1 > SP2	rw	600		
184	0x00B8	0		Switch Point 2	2 bytes	rP1 > SP2 > rP2	rw	550		
185	0x00B9	0		Reset Point 2	2 bytes	SP2 > rP2 >= 10	rw	540		
186	0x00BA	0		Duration automatic blow	2 bytes	10 - 9999	rw	200		
187	0x00BB	0		Permissible evacuation time	2 bytes	0 - 9999	rw	2000		
188	0x00BC	0		Permissible leakage rate	2 bytes	0 - 999	rw	250		
199	0x00C7	0		Profile name	1...32 bytes		rw	***		
⌄ Production Setup - Profile P2										
200	0x00C8	0		Air saving function	1 byte	0 - 2	rw	1	Profile P-2 (selected by PD Out 0 - Profile-Set = 2)	
201	0x00C9	0		Disable continuous suction	1 byte	0 - 1	rw	0		
202	0x00CA	0		Switch Point 1	2 bytes	999 > SP1 > rP1	rw	750		
203	0x00CB	0		Reset Point 1	2 bytes	SP1 > rP1 > SP2	rw	600		
204	0x00CC	0		Switch Point 2	2 bytes	rP1 > SP2 > rP2	rw	550		
205	0x00CD	0		Reset Point 2	2 bytes	SP2 > rP2 >= 10	rw	540		
206	0x00CE	0		Duration automatic blow	2 bytes	10 - 9999	rw	200		
207	0x00CF	0		Permissible evacuation time	2 bytes	0 - 9999	rw	2000		
208	0x00D0	0		Permissible leakage rate	2 bytes	0 - 999	rw	250		
219	0x00DB	0		Profile name	1...32 bytes		rw	***		
⌄ Production Setup - Profile P3										
220	0x00DC	0		Air saving function	1 byte	0 - 2	rw	1	Profile P-3 (selected by PD Out 0 - Profile-Set = 3)	
221	0x00DD	0		Disable continuous suction	1 byte	0 - 1	rw	0		
222	0x00DE	0		Switch Point 1	2 bytes	999 > SP1 > rP1	rw	750		
223	0x00DF	0		Reset Point 1	2 bytes	SP1 > rP1 > SP2	rw	600		
224	0x00E0	0		Switch Point 2	2 bytes	rP1 > SP2 > rP2	rw	550		
225	0x00E1	0		Reset Point 2	2 bytes	SP2 > rP2 >= 10	rw	540		
226	0x00E2	0		Duration automatic blow	2 bytes	10 - 9999	rw	200		
227	0x00E3	0		Permissible evacuation time	2 bytes	0 - 9999	rw	2000		
228	0x00E4	0		Permissible leakage rate	2 bytes	0 - 999	rw	250		
239	0x00EF	0		Profile name	1...32 bytes		rw	***		
⌄ Observation										
⌄ Monitoring										
⌄ Process Data										
40	0x0028	0		Process Data In Copy	4 bytes		ro		Copy of currently active process data input	
41	0x0029	0		Process Data Out Copy	2 bytes		ro		Copy of currently active process data output	
64	0x0040	1		Vacuum Value	2 bytes		ro		Actual vacuum value	
64	0x0040	2		Vacuum Value LO	2 bytes		ro		Lowest measured vacuum value since power-up	
64	0x0040	3		Vacuum Value HI	2 bytes		ro		Highest measured vacuum value since power-up	
65	0x0041	1		Pressure Value	2 bytes		ro		Actual pressure value (unit: 1 mbar)	
65	0x0041	2		Pressure Value LO	2 bytes		ro		Lowest measured pressure value since power-up	
65	0x0041	3		Pressure Value HI	2 bytes		ro		Highest measured pressure value since power-up	
66	0x0042	1		Supply Voltage	2 bytes		ro		Supply voltage (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	
148	0x0094	0		Evacuation time t ₀	2 bytes		ro		Time from start of suction to SP2 (unit: 1 ms)	
149	0x0095	0		Evacuation time t ₁	2 bytes		ro		Time from SP2 to SP1 (unit: 1 ms)	
160	0x00A0	0		Leakage rate	2 bytes		ro		Leakage of last suction cycle (unit: 1 mbar/sec)	
161	0x00A1	0		Free-flow vacuum	2 bytes		ro		Last measured free-flow vacuum (unit: 1 mbar)	
164	0x00A4	0		Max. reached vacuum in last cycle	2 bytes		ro		Maximum vacuum value of last suction cycle	
165	0x00A5	0		Min. pressure during last cycle	2 bytes		ro		Minimum input pressure during suction phase of last cycle	
⌄ Counters										
140	0x008C	0	cc1	Vacuum-on counter	4 bytes		ro		Not erasable (stored every 1000 counts)	
141	0x008D	0	cc2	Valve operating counter	4 bytes		ro		Not erasable (stored every 1000 counts)	
142	0x008E	0	cc3	Condition monitoring counter	4 bytes		ro		Not erasable (stored every 1000 counts)	
143	0x008F	0	ct1	Erasable vacuum-on counter	4 bytes		ro		Can be reset by System Command "Reset erasable counters" (stored every 1000 counts)	
144	0x0090	0	ct2	Erasable valve operating counter	4 bytes		ro		Can be reset by System Command "Reset erasable counters" (stored every 1000 counts)	
145	0x0091	0	ct3	Erasable condition monitoring counter	4 bytes		ro		Can be reset by System Command "Reset erasable counters" (stored every 1000 counts)	
⌄ 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	0		Detailed Device Status	96 bytes		ro		Information about currently pending events Fixed-length array format according to IO-Link specification V1.1	
130	0x0082	0		Active Errors	2 bytes		ro		Bit 00: Internal error: data corruption (E01) Bit 01: reserved Bit 02: Primary voltage too low (E07) Bit 03: Primary voltage too high (E17) Bit 04-07: reserved Bit 08: short circuit at OUT2 (E12) Bit 09-10: reserved Bit 11: Measurement range overrun (FFF) Bit 12-14: reserved Bit 15: IO-Link communication interruption (E08)	
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, corresponds to IO-Link events)	



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139	0x008B	0		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 0x31: Write failed: parameter value too high 0x32: Write failed: parameter value too low 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	2 bytes		ro		Bit 0: Valve protection active Bit 1: Evacuation time t1 above limit [-1] Bit 2: Leakage rate above limit [-L-] Bit 3: SP1 not reached in suction cycle Bit 4: Free-flow vacuum > rP2 but < SP1 Bit 5: Primary voltage US outside of optimal range Bit 6: reserved Bit 7: reserved Bit 8: Input pressure outside of operating range Bit 9-15: reserved
⊞ Energy Monitoring [EM]									
156	0x009C	0		Air consumption per cycle	2 bytes		ro		Air consumption of last suction cycle (unit: 0.1 sl/min)
157	0x009D	0		Energy consumption per cycle	2 bytes		ro		Energy consumption of last suction cycle (unit: 1 Ws)
⊞ Predictive Maintenance [PM]									
162	0x00A2	0		Quality	1 byte		ro		Quality of last suction cycle (unit: 1 %)
163	0x00A3	0		Performance	1 byte		ro		Last measured performance level (unit: 1 %)

Coding of Extended Device Status (ISDU 138) and IO-Link Events

Extended Device Status ID (= IO-Link Event Code)		Extended Device Status Type		IO-Link Event Type	Display Code	Event name	Remark
dec	hex	hex	Meaning				
0	0x0000	0x10	Everything OK	(no IOL event)		Everything OK	Device is working optimally
6161	0x1811	0x82	Defect/fault, high	Error	E01	Data Corruption	Internal error, user data corrupted
35872	0x8C20	0x81	Defect/fault, lower	Error	FFF	Measurement range overrun	Measured vacuum value too high, sensor fault
2457	0x0999	0x81	Defect/fault, lower	(no IOL event)	E08	IO-Link communication interruption	IO-Link communication is interrupted (readable via NFC)
20736	0x5100	0x42	Critical condiction, high	Error	E07	General power supply fault	Primary supply voltage (US) too low
20752	0x5110	0x42	Critical condiction, high	Warning	E17	Primary supply voltage over-run	Primary supply voltage (US) too high
6146	0x1802	0x42	Critical condiction, high	Warning		Supply pressure fault	Input pressure too high or too low
6156	0x180C	0x22	Warning, high	Warning		Primary supply voltage out of optimal range	Condition Monitoring: primary supply voltage US outside of operating range
6151	0x1807	0x22	Warning, high	Warning		CM: Valve protection active	Condition Monitoring: valve has switched too fast, continuous suction activated
6152	0x1808	0x21	Warning, low	Warning		CM: evacuation time above limit	Condition Monitoring: evacuation time t1 is above limit [-1]
6153	0x1809	0x21	Warning, low	Warning		CM: leakage rate above limit	Condition Monitoring: leakage rate is above limit [-L-]
6154	0x180A	0x22	Warning, high	Warning		CM: SP1 not reached	Condition Monitoring: vacuum level SP1 was never reached during suction cycle
6155	0x180B	0x21	Warning, low	Warning		CM: free flow vacuum too high	Condition Monitoring: free flow vacuum above SP2
35841	0x8C01	0x21	Warning, low	Warning		Simulation active	Manual mode is active
6144	0x1800	-	(IOL event only)	Notification		Vacuum calibration OK	Calibration offset 0 set successfully
6145	0x1801	0x22	Warning, high	Notification	E03	Vacuum calibration failed	Sensor value too high or too low, offset not changed
6167	0x1817	-	(IOL event only)	Notification		Autoset completed successfully	Permissible leakage and permissible evacuation time have been set automatically for the active profile
6168	0x1818	-	(IOL event only)	Notification		Handling Cycle Completed	Handling of the part is complete (neutral state of vacuum system reached or new suction phase begun)
30480	0x7710	0x41	Critical condiction, low	Error	E12	short circuit at OUT2	output is connect with counterpotential