IO-Link Parameter Datasheet



IO-Link Valve Connector

VM*-2+P-*V15-G (Class B)

Support: fa-info@pepperl-fuchs.com
Internet: www.pepperl-fuchs.com
DOCT-9776A - Version 1.01.000 / 2025-08-20

General Information

Device Identification	
Vendor ID	1 (0x0001)
Device ID	984834 (0x0F0702)

Features	
Data Storage	Yes
Block Parameterization	Yes

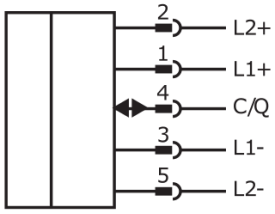
Communication Characteristics	
IO-Link revision	V1.1 (specification V1.1.4)
IO-Link backward compatibility	n/a
Data transmission rate	COM2 (38.4 kbit/s)
Min. cycle time	2.8 ms
Process data input	8 bit
Process data output	8 bit
SIO mode support	no
Compatible master port type	Class B

Profile	
Identification and Diagnosis – I&D	16384 (0x4000)
Function Class – Locator	33025 (0x8101)
Function Class – Product URI	33026 (0x8102)

Supported Product Variants

Product ID	*Product Name*	*Description*	*Connector*
70174098	VMA-2+P-0,2M-PUR-IO-V15-G	IO-Link Valve Connector, Form A, 2+P, Port Class B, PUR cable, M12 plug, 5-pin	Plug, M12, 5-pin

Connection

Connection Diagram	*Description*
	**Plug, M12, 5-pin** 1: L+ 2: P24 3: L- 4: C/Q 5: N24

Process Data

Process Data Input

Octet	Bitoffs.	Name	Data type	Length	Value	Unit	Description
0	0	Valve Status	Boolean	1 bit	*0* *1*		Indicates the current status of the valve. *Off* *On*
	1	PWM Value	UInteger	7 bit	0, 10 .. 100	%	Shows the current PWM value for the valve current.

Process Data Output

Octet	Bitoffs.	Name	Data type	Length	Value	Unit	Description
0	0	Valve Control	Boolean	1 bit	*0* *1*		Controls the on/off status of the valve. *Off* *On*
	1	PWM Control	UInteger	7 bit	0, 10 .. 100	%	Sets the PWM value for the valve current. If the value is 10 or less, the defined value in the parameter PWM Value is applied.

Parameter Data

Identification

Index	Parameter	Access	Data type	Length	Default	Description	DS	R
16 (0x10)	Vendor Name	ro	String	13 byte	Pepperl+Fuchs	The vendor name that is assigned to a Vendor ID.		
17 (0x11)	Vendor Text	ro	String	29 byte	www.pepperl-fuchs.com/io-link	Additional information about the vendor.		
18 (0x12)	Product Name	ro	String	max. 32 byte	*See table Supported Product Variants*	Complete product name.		
19 (0x13)	Product ID	ro	String	8 byte	*See table Supported Product Variants*	Vendor-specific product or type identification (e.g., item number or model number).		
20 (0x14)	Product Text	ro	String	max. 32 byte	IO-Link Valve Connector	Additional product information for the device.		
21 (0x15)	Serial Number	ro	String	14 byte		Unique, vendor-specific identifier of the individual device.		
22 (0x16)	Hardware Revision	ro	String	7 byte	HW**.**	Unique, vendor-specific identifier of the hardware revision of the individual device.		
23 (0x17)	Firmware Revision	ro	String	7 byte	FW**.**	Unique, vendor-specific identifier of the firmware revision of the individual device.		
24 (0x18)	Application Specific Tag	rw	String	max. 32 byte	Your automation, our passion.	Possibility to mark a device with user- or application-specific information.	Y	F
25 (0x19)	Function Tag	rw	String	max. 32 byte	***	Possibility to mark a device with function-specific information.	Y	F
26 (0x1A)	Location Tag	rw	String	max. 32 byte	***	Possibility to mark a device with location-specific information.	Y	F
27 (0x1B)	Product URI	ro	String	24 byte	https://pefu.de/<Product ID>	Provides a unique instance identification compliant to DIN-SPEC 91406.		

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
36 (0x24)	Device Status	ro	UInteger	8 bit		0			Indicator for the current device condition and diagnosis state.		F
							0 *1* *2* *3* *4*		*Device is OK* *Maintenance required* *Out of specification* *Functional check* *Failure*		
37 (0x25)	Detailed Device Status	ro	Array [S0]	3 byte 1 item					List of all currently pending events in the device. *See Event Codes*		F
.1	Element 1		Octetstr	3 byte	0	0					F
80 (0x50)	Switching Cycles Absolute	ro	UInteger	32 bit			0 .. 2^{32}-1		Shows the absolute number of valve switching cycles since initial commissioning.		
82 (0x52)	Switching Cycles Relative	rw	UInteger	32 bit		0	0 .. 2^{32}-1		Shows the number of valve switching cycles since the last application reset, restore to factory settings or manual reset of the value.	Y	FA
100 (0x64)	Supply Voltages	ro	Record	2 byte					Shows all current supply voltages of the device.		
.1	Actuator Supply Voltage	ro	UInteger	8 bit	8		0 .. 255	V	Shows the current actuator supply voltage of the device.		
.2	Sensor Supply Voltage	ro	UInteger	8 bit	0		0 .. 255	V	Shows the current sensor supply voltage of the device.		
101 (0x65)	On Resistance	ro	UInteger	16 bit			0 .. 65535	Ω	Shows the current on resistance of the valve.		
104 (0x68)	Switching Time	ro	UInteger	16 bit			0 .. 65535	ms	Shows the time for the valve to switch on.		
105 (0x69)	Valve Current	ro	UInteger	16 bit			0 .. 65535	mA	Shows the supply current of the valve.		
107 (0x6B)	Valve Power	ro	UInteger	32 bit			0 .. 2^{32}-1	mW	Shows the current power dissipation of the valve.		
108 (0x6C)	Temperature	ro	Integer	16 bit			-100 .. 200	°C	Shows the currently observed operating temperature of the connector.		
110 (0x6E)	Overtemperature Exceeded Counter	ro	UInteger	16 bit			0 .. 65535		Shows the number of overtemperature incidents with operating temperatures above the configured temperature limit.		
111 (0x6F)	Maximum Operating Temperature	ro	Integer	16 bit			-100 .. 200	°C	Shows the maximum observed temperature in powered operation since the last reset of the maximum value.		FA
112 (0x70)	Maximum Temperature Reset	wo	UInteger	8 bit					The stored value for maximum observed device temperature is reset to the current temperature value.		
							1		*Maximum Temperature Reset*		
120 (0x78)	Diagnosis Status	ro	Record [S0]	2 byte					Shows the diagnosis states for different incident channels.		
.1	Switching Cycles Absolute Overflow	ro	Boolean	1 bit	0				Indicates that the number of switching cycles since initial commissioning has exceeded the configured limit. Check or replace valve and connector.		
							0 *1*		*Inactive* *Active*		
.2	Switching Cycles Relative Overflow	ro	Boolean	1 bit	1				Indicates that the number of switching cycles since the last application reset, restore to factory settings or manual reset has exceeded the configured limit. Check or replace valve and connector.		
							0 *1*		*Inactive* *Active*		
.3	Temperature Underrun	ro	Boolean	1 bit	2				Indicates that the temperature has dropped below the specified limit.		

Diagnosis

Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
							0 *1*		*Inactive* *Active*		
.4	Temperature Overrun	ro	Boolean	1 bit	3		*0* *1*		Indicates that the temperature has exceeded the configured limit. *Inactive* *Active*		
.5	Valve Switching Alarm	ro	Boolean	1 bit	4		*0* *1*		Indicates that the valve didn't switch within the expected time. *Inactive* *Active*		
.6	Sensor Supply Undervoltage	ro	Boolean	1 bit	5		*0* *1*		Indicates that the sensor supply voltage is below the specified limit. *Inactive* *Active*		
.7	Sensor Supply Overvoltage	ro	Boolean	1 bit	6		*0* *1*		Indicates that the sensor supply voltage is above the specified limit. *Inactive* *Active*		
.8	Sensor Power Supply Fault	ro	Boolean	1 bit	7		*0* *1*		Indicates that the sensor supply voltage is out of the specified range. *Inactive* *Active*		
.9	Actuator Supply Undervoltage	ro	Boolean	1 bit	8		*0* *1*		Indicates that the actuator supply voltage is below the specified limit. *Inactive* *Active*		
.10	Actuator Supply Overvoltage	ro	Boolean	1 bit	9		*0* *1*		Indicates that the actuator supply voltage is above the specified limit. *Inactive* *Active*		
.11	Actuator Power Supply Fault	ro	Boolean	1 bit	10		*0* *1*		Indicates that the actuator supply voltage is out of the specified range. *Inactive* *Active*		
.12	Overheat Fault	ro	Boolean	1 bit	11		*0* *1*		Indicates that the device is overheated due to load or ambient conditions. *Inactive* *Active*		
.13	Open Circuit Fault	ro	Boolean	1 bit	12		*0* *1*		Indicates that the connection to the valve is interrupted. *Inactive* *Active*		
.14	Current Overload	ro	Boolean	1 bit	13		*0* *1*		Indicates that the detected load on the valve connector is too high. *Inactive* *Active*		
.15	Short Circuit	ro	Boolean	1 bit	14		*0* *1*		Indicates that a short circuit is detected at the valve connector. *Inactive* *Active*		
.16	No Actuator Supply Fault	ro	Boolean	1 bit	15		*0* *1*		Indicates that no actuator power supply is connected. *Inactive* *Active*		

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
77 (0x4D)	Valve Operation Mode	rw	UInteger	8 bit		0	*0* *1* *2* *3* *4* *5*		Selects between different modes of operation for the valve connector. *Smart* *Standard* *On/off sequence* *Off/on sequence* *Off/on delay* *On/off delay*	Y	FA
78 (0x4E)	Valve On Time	rw	UInteger	16 bit		1	0 .. 65535	s	Defines the delay time for the valve to turn on after being triggered.	Y	FA
79 (0x4F)	Valve Off Time	rw	UInteger	16 bit		9	0 .. 65535	s	Defines the delay time for the valve to turn off after being triggered.	Y	FA
81 (0x51)	Switching Cycles Absolute Limit	rw	UInteger	32 bit		10^7	0 .. 2^{32}-1		Defines the limit of valve switching cycles since initial commissioning. If the limit is exceeded the according status flag in the parameter Diagnosis Status is set.	Y	FA
83 (0x53)	Switching Cycle Relative Limit	rw	UInteger	32 bit		$2*10^6$	0 .. 2^{32}-1		Defines the limit of valve switching cycles since the last application reset, restore to factory settings or manual reset of the value. If the limit is exceeded the according status flag in the parameter Diagnosis Status is set.	Y	FA
102 (0x66)	PWM Value	rw	UInteger	8 bit		50	10 .. 100	%	Defines the mark-space ratio of the PWM modulated valve current in percent.	Y	FA
103 (0x67)	Pick-up Time	rw	UInteger	16 bit		150	5 .. 2000	ms	Defines the pick-up time of the valve current.	Y	FA
106 (0x6A)	Valve Current Limit	rw	UInteger	16 bit		2000	0 .. 2000	mA	Defines a threshold for the valve current. If this limit is exceeded the according status flag in the parameter Diagnosis Status is set.	Y	FA
109 (0x6D)	Temperature Limit	rw	Integer	16 bit		85	-100 .. 200	°C	Defines a maximum temperature threshold for the device operation. If the limit is exceeded the according status flag in the parameter Diagnosis Status is set.	Y	FA
113 (0x71)	Indication Mode	rw	UInteger	8 bit		0	*0* *1*		Selects the indication mode for the LED to either communication state or valve state. *Valve state* *Communication state*	Y	FA
114 (0x72)	LED Color Off	rw	UInteger	8 bit		2	*0* *1* *2* *3* *4* *5* *6* *7*		Selects the color of the LED for indication of an off-state. *Off* *Blue* *Green* *Cyan* *Red* *Magenta* *Yellow* *White*	Y	FA
115 (0x73)	LED Color On	rw	UInteger	8 bit		6			Selects the color of the LED for indication of an on-state. *See index 114.*	Y	FA
116 (0x74)	LED Color Warning	rw	UInteger	8 bit		4			Selects the color of the LED for indication of a pending warning. *See index 114.*	Y	FA

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
117 (0x75)	LED Mode Warning	rw	UInteger	8 bit		1	*0* *1*		Selects the indication mode of the LED for a pending warning to either constantly on or blinking. *Constant* *Blinking*	Y	FA
119 (0x77)	Event Configuration	rw	UInteger	8 bit		0	*0* *1*		Enables triggering of events from available event sources if an according incident is detected. *Disabled* *Enabled*	Y	F A
121 (0x79)	Fail Safe State	rw	Record	2 byte					Defines the target state of the valve if a failure is detected.	Y	F A
.1	No Communication	rw	UInteger	8 bit	8	0	*0* *1* *2*		Defines the target state of the valve if a C/Q line cut or communication loss is detected. *Reset* *Set* *Hold*	Y	F A
.2	No Sensor Supply	rw	UInteger	8 bit	0	0	*0* *1* *2* *3* *4*		Defines the target state of the valve if no sensor supply is detected. *Reset* *Set* *Hold* *Force reset* *Force set*	Y	F A

NOTE 1: The parameter data provide the attributes DS (Data Storage) and R (Reset behavior). The following rules apply:
DS: Parameter marked with ‘Y’ (yes) are exchanged with the master via the data storage mechanism.
R: Parameter marked with ‘F’ are reset to the factory default value upon reception of the command ‘Restore Factory Settings’ or ‘Back-to-box’.
Parameter marked with ‘A’ are reset to the factory default value upon reception of the command ‘Application Reset’.

NOTE 2: Parameter with datatype Record or Array, which are marked with ‘S0’ can only be accessed over subindex 0 (whole parameter object). Subindex access to single items is not possible.

Command Interface

Index	*Parameter*	*Access*	*Data type*	*Length*	*Value*	*Description*
2 (0x02)	System Command	wo	UInteger	8 bit	See command value	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

Command Value	*Command*	*Description*
126 (0x7E)	Locator Start	The visual indicators of the device are switched to the localization display pattern, which makes it easier to spot a device in an application.
127 (0x7F)	Locator Stop	The localization indication pattern is stopped. The optical indicators of the device will show again the device specific states of operation.
129 (0x81)	Application Reset	The parameters of the technology-specific application are set to default values. Identification parameters remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master.
130 (0x82)	Restore Factory Settings	The parameters of the device are reset to factory settings. Note: A download of the data storage may be executed on the next power cycle and overwrite the factory default settings!
131 (0x83)	Back-to-box	The parameters of the device are set to factory default values and communication will be inhibited until the next power cycle. Note: Directly detach the device from the master port!

Error Codes

Code	*Additional code*	*Name*	*Description*
128 (0x80)	17 (0x11)	Index not available	Read or write access attempt to a non-existing index.
128 (0x80)	18 (0x12)	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
128 (0x80)	32 (0x20)	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
128 (0x80)	33 (0x21)	Service temporarily not available - local control	Parameter not accessible. The device is currently in an ongoing, locally controlled operation.
128 (0x80)	34 (0x22)	Service temporarily not available - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
128 (0x80)	35 (0x23)	Access denied	Write access to a read-only parameter or read access to write-only parameter.
128 (0x80)	48 (0x30)	Parameter value out of range	Written parameter value is outside of the permitted value range.
128 (0x80)	49 (0x31)	Parameter value above limit	Written parameter value is above its specified value range.
128 (0x80)	50 (0x32)	Parameter value below limit	Written parameter value is below its specified value range.
128 (0x80)	51 (0x33)	Parameter length overrun	Written parameter is longer than specified.
128 (0x80)	52 (0x34)	Parameter length underrun	Written parameter is shorter than specified.
128 (0x80)	53 (0x35)	Function not available	Written command is not supported by the technology-specific application.
128 (0x80)	54 (0x36)	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
128 (0x80)	64 (0x40)	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
128 (0x80)	65 (0x41)	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.

Event Codes

Code	*Type*	*Name*	*Description*
16912 (0x4210)	Warning	Device temperature overrun	Clear source of heat
16928 (0x4220)	Warning	Device temperature underrun	Insulate Device
20752 (0x5110)	Warning	Primary supply voltage overrun	Check tolerance
20753 (0x5111)	Warning	Primary supply voltage underrun	Check tolerance
20754 (0x5112)	Warning	Secondary supply voltage fault (Port Class B)	Check tolerance
16384 (0x4000)	Error	Temperature fault	Overload
20736 (0x5100)	Error	General power supply fault	Check availability
30480 (0x7710)	Error	Short circuit	Check installation
36000 (0x8CA0)	Warning	Output current overload	Check the load and current consumption.
36001 (0x8CA1)	Warning	Overflow Counter Absolute	Maintenance request: The limit for switching cycles since initial commissioning has been reached. Check or replace valve and connector.
36002 (0x8CA2)	Warning	Overflow Counter Relative	Maintenance request: The limit for switching cycles since the last reset has been reached. Check or replace valve and connector.
36003 (0x8CA3)	Warning	Output open-circuit	Check the load and valve connection.
36004 (0x8CA4)	Warning	No actuator supply	Check the actuator power supply connection.
36005 (0x8CA5)	Warning	Actuator supply overvoltage	Check the actuator power supply tolerance.
36006 (0x8CA6)	Warning	Actuator supply undervoltage	Check the actuator power supply tolerance.