IO-Link Parameter Datasheet

I/O-Hub

ICA-8DIO-CB10-IO

PEPPERL+FUCHS

IO-Link

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DOCT-8274 - Version 1.00.000 / 2022-06-03

General Information

Device Identification	
Vendor ID	1 (0x0001)
Device ID	984577 (0x0F0601)

Features	
Data Storage	Yes
Block Parameterization	Yes

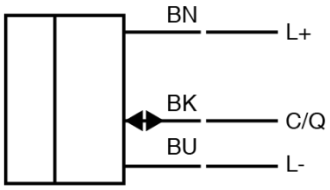
Communication Characteristics	
IO-Link revision	V1.1 (specification V1.1.3)
IO-Link backward compatibility	n/a
Data transmission rate	COM3 (230.4 kbit/s)
Min. cycle time	1.0 ms
Process data input	2 byte
Process data output	2 byte
SIO mode support	no
Compatible master port type	Class A, Class B

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

Supported Product Variants

Product ID	*Product Name*	*Description*	*Connector*
70127373	ICA-8DIO-CB10-IO	IO-Link printed circuit board module with 8 configurable digital inputs / outputs	Cable strands

Connection

Connection Diagram	*Description*
	**Cable strands** Brown: +24V Blue: 0V Black: C/Q

Process Data

Process Data Input

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	Input 1 Status	Boolean	1 bit	0	*false* *true*		Indicates the current input status according to logic configuration. *Low* *High*
.2	Input 2 Status	Boolean	1 bit	1			See subindex 1.
.3	Input 3 Status	Boolean	1 bit	2			See subindex 1.
.4	Input 4 Status	Boolean	1 bit	3			See subindex 1.
.5	Input 5 Status	Boolean	1 bit	4			See subindex 1.
.6	Input 6 Status	Boolean	1 bit	5			See subindex 1.
.7	Input 7 Status	Boolean	1 bit	6			See subindex 1.
.8	Input 8 Status	Boolean	1 bit	7			See subindex 1.
.10	Digital Output Overload	Boolean	1 bit	9	*false* *true*		Indicates an overload condition at a digital output. *Inactive* *Active*
.11	Port Supply Overload	Boolean	1 bit	10	*false* *true*		Indicates an overload condition at the port supply. *Inactive* *Active*
.12	Module Overtemperature	Boolean	1 bit	11	*false* *true*		Indicates the ambient temperature is above the specified range. *Inactive* *Active*
.14	Module Supply Undervoltage	Boolean	1 bit	13	*false* *true*		Indicates the main supply voltage is below the specified range. *Inactive* *Active*

Process Data Output

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	Output 1 Control	Boolean	1 bit	0	*false* *true*		Sets the output according to logic configuration. *Low* *High*
.2	Output 2 Control	Boolean	1 bit	1			See subindex 1.
.3	Output 3 Control	Boolean	1 bit	2			See subindex 1.
.4	Output 4 Control	Boolean	1 bit	3			See subindex 1.
.5	Output 5 Control	Boolean	1 bit	4			See subindex 1.
.6	Output 6 Control	Boolean	1 bit	5			See subindex 1.
.7	Output 7 Control	Boolean	1 bit	6			See subindex 1.
.8	Output 8 Control	Boolean	1 bit	7			See subindex 1.
.9	Output 1 Indication	Boolean	1 bit	8	*false* *true*		Sets the output indication according to indication and logic configuration. The corresponding Output Control must be low for indication operation. *Inactive* *Active*
.10	Output 2 Indication	Boolean	1 bit	9			See subindex 9.
.11	Output 3 Indication	Boolean	1 bit	10			See subindex 9.
.12	Output 4 Indication	Boolean	1 bit	11			See subindex 9.
.13	Output 5 Indication	Boolean	1 bit	12			See subindex 9.
.14	Output 6 Indication	Boolean	1 bit	13			See subindex 9.
.15	Output 7 Indication	Boolean	1 bit	14			See subindex 9.
.16	Output 8 Indication	Boolean	1 bit	15			See subindex 9.

NOTE: The process data input content can also be read via parameter ‘Process Data Input’ at index 40 (0x28).
The process data output content can also be read via parameter ‘Process Data Output’ at index 41 (0x29).

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. 30 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	7 byte	I/O-Hub	Additional product information for the device.		
21 (0x15)	Serial Number	ro	String	14 byte	<serial number>	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	30 byte	https://pefu.de/<serial number>	Provides a unique instance identification compliant to DIN-SPEC 91406.		
192 (0xC0)	Installation Tag	rw	String	max. 32 byte	***	Can be used to note the initial commissioning data or date. This entry is not transferred to a new device on replacement.		F

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
64 (0x40)	Digital I/O 1 Config	rw	Record	7 byte					Defines the configuration for the digital I/O.	Y	FA
.1	Type	rw	UInteger	8 bit	48	1	*1* *2*		Defines the input or output type of the digital I/O channel. *Digital input - PNP* *Digital output - PNP*	Y	FA
.2	Logic	rw	UInteger	8 bit	40	0	*0* *1*		Defines the logic behavior of the digital I/O. *High active (PD high - I/O active)* *Low active (PD low - I/O active)*	Y	FA
.3	High Signal Suppression	rw	UInteger	8 bit	32	0	*0* *1* *2* *3* *4* *5* *6* *7* *8* *9* *10* *11* *12* *13* *14*		Defines the suppression time for a high signal at the digital input. *Disabled* *0.5 ms* *1.0 ms* *2.0 ms* *5.0 ms* *10 ms* *20 ms* *50 ms* *100 ms* *200 ms* *500 ms* *1 s* *2 s* *5 s* *10 s*	Y	FA
.4	Low Signal Suppression	rw	UInteger	8 bit	24	0	..		Defines the suppression time for a low signal at the digital input. *See subindex 3*	Y	FA
.5	High Signal Extension	rw	UInteger	8 bit	16	0	*0* *1* *2* *3* *4* *5* *6* *7* *8* *9* *10* *11* *12* *13* *14*		Defines the extension time for a high signal at the digital input. *Disabled* *Auto: 1.5 * [Master Cycle Time]* *1.0 ms* *2.0 ms* *5.0 ms* *10 ms* *20 ms* *50 ms* *100 ms* *200 ms* *500 ms* *1 s* *2 s* *5 s* *10 s*	Y	FA
.6	Low Signal Extension	rw	UInteger	8 bit	8	0	..		Defines the extension time for a low signal at the digital input. *See subindex 5*	Y	FA
.7	Substitute Behavior	rw	UInteger	8 bit	0	0	*0* *1* *2*		Defines the substitute value for the digital output in case of invalid process data. *low* *high* *Hold (low after power up)*	Y	FA
65 (0x41)	Digital I/O 2 Config	rw	Record	7 byte					See index 64.	Y	FA
66 (0x42)	Digital I/O 3 Config	rw	Record	7 byte					See index 64.	Y	FA
67 (0x43)	Digital I/O 4 Config	rw	Record	7 byte					See index 64.	Y	FA
68 (0x44)	Digital I/O 5 Config	rw	Record	7 byte					See index 64.	Y	FA
69 (0x45)	Digital I/O 6 Config	rw	Record	7 byte					See index 64.	Y	FA
70 (0x46)	Digital I/O 7 Config	rw	Record	7 byte					See index 64.	Y	FA
61 (0x47)	Digital I/O 8 Config	rw	Record	7 byte					See index 64.	Y	FA

Parameterization & Configuration											
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Default***	***Value***	***Unit***	***Description***	***DS***	***R***
103 (0x67)	Output Indication Config	rw	Record	8 byte					Defines an indication pattern for each digital output.	Y	FA
.1	Output 1 Indication Pattern	rw	UInteger	8 bit	56	0	*0* *1* *2* *3* *4* *5* *6* *7* *8* *9* *10* *11*		Defines an indication pattern for the output, which can be activated via process data (output logic is applied). *Disabled* *0.5 Hz - 20% duty cycle* *0.5 Hz - 50% duty cycle* *0.5 Hz - 80% duty cycle* *1.0 Hz - 20% duty cycle* *1.0 Hz - 50% duty cycle* *1.0 Hz - 80% duty cycle* *2.0 Hz - 20% duty cycle* *2.0 Hz - 50% duty cycle* *2.0 Hz - 80% duty cycle* *4.0 Hz - 50% duty cycle* *1.0 Hz double flash*	Y	FA
.2	Output 2 Indication Pattern	rw	UInteger	8 bit	48	0			See subindex 1.	Y	FA
.3	Output 3 Indication Pattern	rw	UInteger	8 bit	40	0			See subindex 1.	Y	FA
.4	Output 4 Indication Pattern	rw	UInteger	8 bit	32	0			See subindex 1.	Y	FA
.5	Output 5 Indication Pattern	rw	UInteger	8 bit	24	0			See subindex 1.	Y	FA
.6	Output 6 Indication Pattern	rw	UInteger	8 bit	16	0			See subindex 1.	Y	FA
.7	Output 7 Indication Pattern	rw	UInteger	8 bit	8	0			See subindex 1.	Y	FA
.8	Output 8 Indication Pattern	rw	UInteger	8 bit	0	0			See subindex 1.	Y	FA
111 (0x6F)	Module ID	rw	UInteger	8 bit		0	0 .. 127		Possibility to identify a device in an application, in which devices are dynamically exchanged.	Y	FA
120 (0x78)	Event Config	rw	Record [S0]	2 byte					Defines which event sources can trigger events.	Y	FA
.1	Warning - Port Supply Overload	rw	Boolean	1 bit	0	false	*false* *true*		Generates an event if the port supply is in overload state. *Disabled* *Enabled*	Y	FA
.2	Warning - Digital Output Overload	rw	Boolean	1 bit	1	false	*false* *true*		Generates an event if a digital output is in overload state. *Disabled* *Enabled*	Y	FA
.3	Warning - Module Supply Undervoltage	rw	Boolean	1 bit	2	false	*false* *true*		Generates an event if the module supply voltage is below the specified range. *Disabled* *Enabled*	Y	FA

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

Diagnosis								
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Value***	***Unit***	***Description***
36 (0x24)	Device Status	ro	UInteger	8 bit		*0* *1* *2* *3* *4*		Indicator for the current device condition and diagnosis state. *Device is OK* *Maintenance required* *Out of specification* *Functional check* *Failure*
37 (0x25)	Detailed Device Status	ro	Array [S0]	12 byte				List of all currently pending events in the device.
.1	Element 1		Octetstr	3 byte	72			
.2	Element 2		Octetstr	3 byte	48			
.3	Element 3		Octetstr	3 byte	24			
.4	Element 4		Octetstr	3 byte	0			
176 (0xB0)	Device Characteristics	ro	Record [S0]	6 byte				Shows relevant key characteristics of the device for use in applications.
.1	Max. Digital I/O	ro	UInteger	16 bit	32			Shows the maximum number of supported digital inputs/outputs.
.2	Max. Output Load Current	ro	UInteger	16 bit	16		mA	Shows the maximum output load current.
.3	Supply Current Requirement	ro	UInteger	16 bit	0		mA	Shows the maximum specified supply current for the device excluding load.
224 (0xE0)	Operating Hours	ro	UInteger	32 bit		0 .. 2^{32}-1	h	Shows the overall hours of operation since initial commissioning.
225 (0xE1)	Temperature Indicator	ro	UInteger	8 bit		*0* *1* *2* *3* *4*		Indicates the operation at ambient temperatures close to or in excess of specification limits. *Operating condition OK* *Close to upper limit* *Upper limit exceeded* *Close to lower limit* *Lower limit exceeded*
226 (0xE2)	Temperature Monitor	ro	Record [S0]	9 byte				Contains parameters showing current and past conditions of temperature exposure since initial commissioning.
.1	Overtemperature Operating Hours	ro	UInteger	32 bit	40	0 .. 2^{32}-1	h	Shows the overall hours of powered operation above the specified temperature limit since initial commissioning.
.2	Overtemperature Exceeded Counter	ro	UInteger	16 bit	24	0 .. 65535		Shows the number of transitions to operating temperatures above the specified limit in powered operation since initial commissioning.
.3	Maximum Operating Temperature	ro	Integer	8 bit	16	-40 .. 125	°C	Shows the maximum observed temperature in powered operation since initial commissioning.
.4	Minimum Operating Temperature	ro	Integer	8 bit	8	-40 .. 125	°C	Shows the minimum observed temperature in powered operation since initial commissioning.
.5	Device Operating Temperature	ro	Integer	8 bit	0	-40 .. 125	°C	Shows the currently observed operating temperature of the device.
227 (0xE3)	Power Monitor	ro	Record [S0]	16 byte				Contains parameters showing the power cycle and uptime statistics since initial commissioning.
.1	Power Cycle Count	ro	UInteger	32 bit	96			Shows the number of power cycles since initial commissioning.
.2	Maximum Uptime	ro	UInteger	32 bit	64			Shows the maximum observed powered operating time between power cycles in seconds since initial commissioning.
.3	Average Uptime	ro	UInteger	32 bit	32			Shows the average observed powered operating time between power cycles in seconds since initial commissioning.
.4	Uptime	ro	UInteger	32 bit	0			Shows the current operating time since the last power cycle in seconds.

Diagnosis								
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Value***	***Unit***	***Description***
228 (0xE4)	Load Monitor	ro	Record S0	13 byte				Contains parameters showing the operation in overload condition since initial commissioning.
.1	Overload Operating Time	ro	UInteger	32 bit	72	0 .. 2^{32}-1	min	Shows the overall minutes of operation under overload condition since initial commissioning.
.2	Overload Counter	ro	UInteger	32bit	40	0 .. 2^{32}-1		Shows the number of transitions from normal to overload condition since initial commissioning.
.3	Maximum Overload Time	ro	UInteger	32 bit	8	0 .. 2^{32}-1	min	Shows the maximum observed time with operation under overload conditions since initial commissioning.
.4	Current Overload Condition	ro	UInteger	8 bit	0	*false* *true*		Shows the current overload condition. *Inactive* *Active*
232 (0xE8)	Port Supply Diagnosis	ro	Record S0	1 byte				Shows the diagnosis status of each port supply.
.1	Port 1 Overload Alarm	ro	Boolean	1 bit	0	*false* *true*		Shows the diagnosis status for an overload condition on this port. *Inactive* *Active*
233 (0xE9)	Digital Output Channel Diagnosis	ro	Record S0	1 byte				Shows the diagnosis status for each individual digital output.
.1	Output 1 Overload Alarm	ro	Boolean	1 bit	0	*false* *true*		Shows the diagnosis status for an overload condition on this output. *Inactive* *Active*
.2	Output 2 Overload Alarm	ro	Boolean	1 bit	1			See subindex 1.
.3	Output 3 Overload Alarm	ro	Boolean	1 bit	2			See subindex 1.
.4	Output 4 Overload Alarm	ro	Boolean	1 bit	3			See subindex 1.
.5	Output 5 Overload Alarm	ro	Boolean	1 bit	4			See subindex 1.
.6	Output 6 Overload Alarm	ro	Boolean	1 bit	5			See subindex 1.
.7	Output 7 Overload Alarm	ro	Boolean	1 bit	6			See subindex 1.
.8	Output 8 Overload Alarm	ro	Boolean	1 bit	7			See subindex 1.
234 (0xEA)	Module Diagnosis	ro	Record S0	1 byte				Shows the diagnosis status of the module.
.2	Supply Undervoltage Alarm	ro	Boolean	1 bit	1	*false* *true*		Shows the diagnosis status for an undervoltage condition on the module power supply. *Inactive* *Active*
.5	Overtemperature Alarm	ro	Boolean	1 bit	4	*false* *true*		Shows the diagnosis status for an ambient temperature condition above the specified range. *Inactive* *Active*

Observation								
Index .sub	***Parameter***	***Access***	***Data type***	***Length***	***Bitoffs.***	***Value***	***Unit***	***Description***
36 (0x24)	Device Status	ro	UInteger	8 bit				Indicator for the current device condition and diagnosis state. *See Diagnosis – Device Status.*
40 (0x28)	PD Input	ro	Record S0	8 byte				Last valid process input data of the device. *See Process Data Input.*
41 (0x29)	PD Output	ro	Record S0	6 byte				Last valid process output data written to the device. *See Process Data Output.*

NOTE: Parameters with datatype Record or Array, which are marked with ‘S0’ can only be accessed via 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	Starts the Locator indication (double flashing every second) with all green and yellow LEDs.
127 (0x7F)	Locator Stop	Stops the Locator indication.
129 (0x81)	Application Reset	The parameter of the technology-specific application are set to default values. Identification parameter remain unchanged. An upload to the data storage of the master will be executed, if activated in the port configuration of the master.
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*
36163 (0x8D43)	Warning	Ambient temperature outside specified temperature range.	Check sensor environment for heat sources.
36176 (0x8D50)	Warning	Load at port supply outside specified range.	Check sensor and cabelling.
36177 (0x8D51)	Warning	Load at a digital output outside specified range.	Check actuator and cabelling.
36178 (0x8D52	Warning	Module supply below specified range.	Check power supply.