CP20.248-IOL   CP20.242-IOL

IO-LINK INTERFACE DESCRIPTION

The power supply provides three different types of data via IO-Link interface:

- Process data
- Parameter values
- Events

VENDOR INFORMATION

Vendor ID	1093/ 0x0445
Device ID	CP20.242-IOL: 9/ 0x0009
	CP20.248-IOL: 29/ 0x00001D
Vendor name	PULS GmbH
Vendor text	www.pulspower.com
Vendor URL	www.pulspower.com

IO-LINK INTERFACE

IO-Link revision	V1.1
Bit rate	COM3 (230.4 kBaud)
Minimum cycle time	2.0 ms
SIO-Mode support	No
Connection type	3-pole push-in

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1. Process data

Process data are cyclically sent to the IO-Link master. CP20.242-IOL and CP20.248-IOL provide output current (A) and output voltage (V) as process data. The data length is 6 bytes, showing actual current between 0 – 65 A in the first two bytes. The next two bytes shows the actual voltage between 0 – 35 V. The last two bytes shows different warning and error flags. If these bytes are 0, no warning or error is active. This process data is transmitted every 2 ms automatically. The accuracy is 100 mA for output current and 100 mV for output voltage.

Table 1: Process data in data format

	Byte 0 (MSB)								Byte 1							
Bit No.	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
Current	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}	2^{-8}

	Byte 2								Byte 3							
Bit No.	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Voltage	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}	2^{-8}

	Byte 4							
Bit No.	15	14	13	12	11	10	9	8
Event	-	-	-	-	Input voltage too high	Input voltage too low	Output voltage too low	-

	Byte 5 (LSB)							
Bit No.	7	6	5	4	3	2	1	0
Event	Device temperature too high	Output current too high	Output voltage too high	Internal device error	Over-temperature protection active (OTP)	Overload protection active (OLP)	Overvoltage protection active (OVP)	-

2. Parameter values

Parameter values are exchanged acyclically and at the request of the IO-Link master. Depending on the access rights device data can be written to the device, read from the device or both.

Parameter values are generated every 52 ms and stored in the IO-Link registers. A timer is used to supervise the time interval. If the time interval between two received bytes is longer than 100 ms or any error occurs (e.g. checksum error), the previously received data will be discarded and the IO-Link read access returns the error 0x8082 "Application not ready".

Table 2: ISDU parameters

Index	Sub index	Object name	Data type	Bit length	Access rights	Gradient & unit	Description
64	0	EEPROM status	uint8	8	R		0: ok 1: recoverable error 2: unrecoverable error
66	0	Softregulation / Parallel use	bool	8	R/W		True/255: activates Parallel Mode False/0: deactivates Parallel Mode
67	0	Remote shutdown	bool	8	R/W		True/255: turns output off False/0: turns output on
68	0	Min. RMS input voltage	uint16	16	R/W	2^{-5} V/bit	Recorded minimum RMS input voltage from 0 to 700 V with 1 V resolution Value cleared by writing any value
69	0	Clear min. RMS input voltage	bool	8	W		Button functionality to clear the recorded minimum RMS input voltage
70	0	Input undervoltage event counter	uint16	16	R/W	1	Recorded input undervoltage event counter from 0 to 65535 Value cleared by writing any value
71	0	Clear input undervoltage event counter	bool	8	W		Button functionality to clear the recorded input undervoltage event counter
72	0	Max. RMS input voltage	uint16	16	R/W	2^{-5}V/bit	Recorded maximum RMS input voltage from 0 to 700 V with 1 V resolution Value cleared by writing any value
73	0	Clear max. RMS input voltage	bool	8	W		Button functionality to clear the recorded maximum RMS input voltage
76	0	Max. PEAK input voltage	uint16	16	R/W	2^{-5} V/bit	Recorded maximum PEAK input voltage from 0 to 700 V with 1 V resolution Value cleared by writing any value
77	0	Clear max. PEAK input voltage	bool	8	W		Button functionality to clear the recorded maximum PEAK input voltage
78	0	Input overvoltage event counter	uint16	16	R/W	1	Recorded input overvoltage event counter from 0 to 65535 The event counter is also increased when fast input voltage transients happen like the VDE 0160 impulse or a Surge impulse (EN 61000-4-5) between L->N >1.0 kV Value cleared by writing any value
79	0	Clear input overvoltage event counter	bool	8	W		Button functionality to clear the recorded input overvoltage event counter
80	0	Max. output voltage	uint16	16	R/W	2^{-5} V/bit	Recorded maximum output voltage from 0.0 to 64.0 V with 0.1 V resolution Value cleared by writing any value
81	0	Clear max. output voltage	bool	8	W		Button functionality to clear the maximum output voltage

Index	Sub index	Object name	Data type	Bit length	Access rights	Gradient & unit	Description
82	0	Max. output current	uint16	16	R/W	2^{-5} A/bit	Recorded maximum output current from 0.0 to 65.0 A with 0.1 A resolution Value cleared by writing any value
83	0	Clear max. output current	bool	8	W		Button functionality to clear the maximum output current
84	0	Min. device temperature	int16	16	R/W	2^{-5} °C/bit	Recorded minimum device temperature from -40 to +200 °C with 1 °C resolution Value cleared by writing any value
85	0	Clear min. device temperature	bool	8	W		Button functionality to clear the minimum device temperature
86	0	Max. device temperature	int16	16	R/W	2^{-5} °C/bit	Recorded maximum device temperature from -40 to +200 °C with 1 °C resolution Value cleared by writing any value
87	0	Clear max. device temperature	bool	8	W		Button functionality to clear the maximum device temperature
88	0	Actual RMS input voltage	uint16	16	R	2^{-5} V/bit	RMS value of actual the input voltage from 0 to 700 V with 1 V resolution
90	0	Actual output voltage	uint16	16	R	2^{-5} V/bit	Value of the actual output voltage from 0.0 to 64.0 V with 0.1 V resolution
91	0	Actual output current	uint16	16	R	2^{-5} A/bit	Value of the actual output current from 0.0 to 65.0 A with 0.1 A resolution
92	0	Actual device temperature	int16	16	R	2^{-5} °C/bit	Value of the actual device temperature from -40 to +200 °C with 1 °C resolution
93	0	Operating time		40	R		Overall operating time in hours (h) and minutes (min); Access only via subindex 0; max. value hour = 1,111,000 h (126 years); max. value minute = 59 min
	1		uint32	32	R	h	
	2		uint8	8	R	min	
94	0	Turn-on counter	uint32	32	R	1	Cumulated number of power supply turn-ons; max. value = 4,294,967,294
95	0	Firmware version	uint16	16	R	1	Number representing the power supplies firmware version
96	0	Level for maximum output voltage warning	uint16	16	R/W	2^{-5} V/bit	User adjustable overvoltage warning level from 0.0 to 36.0 V with 0.1 V resolution (Hysteresis: 0.5 V) Default: 28.8 V -> Event, see table 3
97	0	Level for maximum output current warning	uint16	16	R/W	2^{-5} A/bit	User adjustable overcurrent warning level from 0.0 to 80.0 A with 0.1 A resolution (Hysteresis: 0.5 A) Default: 24.0 A -> Event, see table 3
98	0	Level for maximum device temperature warning	int16	16	R/W	2^{-5} °C/bit	User adjustable overtemperature warning level from -40 to +200 °C with 1°C resolution (Hysteresis: 2 °C) Default: +120 °C -> Event, see table 3
99	0	Actual IO-Link voltage	uint16	16	R	2^{-5} V/bit	Value of the actual IO-Link voltage supplied by the IO-Link master with 0.1 V resolution
100	0	Level for minimum output voltage warning (DC not OK)	uint16	16	R/W	2^{-5} V/bit	User adjustable output undervoltage level from 2.4 to 30.0 V with 0.1 V resolution (Hysteresis: 0.5 V) Default: 22.0 V -> Event, see table 3

3. Events

Events report the status of the power supply. Typical events are warnings and errors in non-ideal and abnormal situations (e.g. temperature too high, input voltage too low, etc.). These events are triggered by certain situations and will result in an automated notification to the IO-Link master.

Table 3: Event Codes

Event Code	Object Name	Type	Description
0x6320	Parameter error – Check data sheet and values	Error	IOL Standard Event
0x1800	Output voltage too low	Warning	The output voltage is below the user set warning level
0x1802	Overvoltage protection active (OVP)	Error	The output voltage exceeded the maximum allowed value
0x1803	Overcurrent protection active (OCP)	Error	The output current exceeded the maximum allowed value
0x1804	Overtemperature protection active (OTP)	Error	The device temperature exceeded the maximum allowed value
0x1805	Internal device error	Error	An internal device error occured
0x1806	Output voltage too high	Warning	The output voltage exceeds the user set warning level
0x1807	Output current too high	Warning	The output current exceeds the user set warning level
0x1808	Device temperature too high	Warning	The device temperature exceeds the user set warning level
0x1809	Input voltage too low	Warning	The input voltage is below the nominal input voltage range
0x180A	Input voltage too high	Warning	The input voltage exceeds the nominal input voltage range