TRIO3-PS/.../IOL (IO-Link Device) Process data and status information



Data sheet
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1 Description

As an IO-Link device, the TRIO power supplies with integrated electronic device circuit breaker provide the IO-Link master, e.g., a programmable logic controller (PLC), with its current process data and status information.

The IO-Link master-to-IO-Link device communication direction helps you with non-stationary parameterization on the TRIO power supply with integrated electronic device circuit breaker.

Supported power supplies

The following TRIO power supplies with integrated electronic device circuit breakers are supported:

Item designation	Item No.
TRIO3-PS/1AC/24DC/10/4C/IOL	1252696
TRIO3-PS/1AC/24DC/20/8C/IOL	1252697
TRIO3-PS/3AC/24DC/10/4C/IOL	1730827
TRIO3-PS/3AC/24DC/20/8C/IOL	1362791
TRIO3-PS/3AC/24DC/40/8C/IOL	1362792

Table of contents

1 Description 1

2 Cyclic process data 3

2.1 Input process data (PDin) 3

2.2 Output process data (PDout) 6

3 Acyclic status information 8

3.1 IO-Link-specific data 8

3.2 Manufacturer data 8

3.3 Operating data 9

3.4 Signaling data 10

3.5 Configuration 11

3.6 Output data of electronic device circuit breaker 11

3.7 Configuration of electronic device circuit breaker 12

3.8 Event status 13

3.9 Event code 14

2 Cyclic process data

2.1 Input process data (PDin)

Communication direction: IO-Link device to IO-Link master

NOTE

In the IO-Link device-to-IO-Link master communication direction, the input process data (PDin) consists of 18 bytes. Note the specified bit offset during writing. In addition, you can also transmit the input process data acyclically, see Section “Acyclic status information”.

	DPin	Reserved	Reserved	Reserved	DC not OK UOut < 21 V DC	Output power >90%	Reserved	Output voltage	
Byte 0	Bit	143	142	141	140	139	138	137	136
	Subindex	--	--	--	1	2	3	4	

	DPin	Output voltage							
Byte 1	Bit	135	134	133	132	131	130	129	128
	Subindex	4							

	DPin	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Sum of output currents	
Byte 2	Bit	127	126	125	124	123	122	121	120
	Subindex	--	--	--	--	--	--	5	

	DPin	Sum of output currents							
Byte 3	Bit	119	118	117	116	115	114	113	112
	Subindex	5							

	DPin	Status, channel 1		Status, channel 2		Status, channel 3		Status, channel 4	
Byte 4	Bit	111	110	109	108	107	106	105	104
	Subindex	6		7		8		9	

	DPin	Status, channel 5		Status, channel 6		Status, channel 7		Status, channel 8	
Byte 5	Bit	103	102	101	100	99	98	97	96
	Subindex	10		11		12		13	

	DPin	Reserved	Reserved	Nominal current, channel 1			Nominal current, channel 2		
Byte 6	Bit	95	94	93	92	91	90	89	88
	Subindex	--	--	14			15		

	DPin	Reserved	Reserved	Nominal current, channel 3			Nominal current, channel 4		
Byte 7	Bit	87	86	85	84	83	82	81	80
	Subindex	--	--	16			17		

	DPin	Reserved	Reserved	Nominal current, channel 5			Nominal current, channel 6		
Byte 8	Bit	79	78	77	76	75	74	73	72
	Subindex	--	--	18			19		

	DPin	Reserved	Reserved	Nominal current, channel 7			Nominal current, channel 8		
Byte 9	Bit	71	70	69	68	67	66	65	64
	Subindex	--	--	20			21		

	DPin	Load current, channel 1							
Byte 10	Bit	63	62	61	60	59	58	57	56
	Subindex	22							

	DPin	Load current, channel 2							
Byte 11	Bit	55	54	53	52	51	50	49	48
	Subindex	23							

	DPin	Load current, channel 3							
Byte 12	Bit	47	46	45	44	43	42	41	40
	Subindex	24							

	DPin	Load current, channel 4							
Byte 13	Bit	39	38	37	36	35	34	33	32
	Subindex	25							

	DPin	Load current, channel 5							
Byte 14	Bit	31	30	29	28	27	26	25	24
	Subindex	26							

	DPin	Load current, channel 6							
Byte 15	Bit	23	22	21	20	19	18	17	16
	Subindex	27							

	DPin	Load current, channel 7							
Byte 16	Bit	15	14	13	12	11	10	9	8
	Subindex	28							

	DPin	Load current, channel 8							
Byte 17	Bit	7	6	5	4	3	2	1	0
	Subindex	29							

DC status

The DC status is transmitted in one bit and corresponds to the current status of the power supply: 0: UOut > 21 V DC (DC OK), 1: UOut < 21 V DC (DC not OK)

Output power status

The status of the output power is transmitted in one bit and corresponds to the current status of the power supply: 0: POut < 90%, 1: POut > 90%

Output voltage

Voltage range 0 V ... 35.5 V (resolution 0.1 V)

Sum of output currents

Current range 0 A ... 65 A (resolution 0.1 A)

Channel status

The channel status is transmitted in two bits and corresponds to the current status of each channel: Channel status 00: OFF, 01: ON, 10: Restart, 11: Tripped/Defect

Tripping current INom

The INom tripping current is transmitted for each channel in three bits.

NEC Class 2 Output						
0b000	0b001	0b010	0b011	0b100	0b101	0b110
1 A	2 A	3.8 A	4 A	6 A	8 A	10 A

Load current, channel

The load current at a channel is encoded in one byte. With a resolution of 0.1 the value range 0 ... 255 corresponds to the value range 0.0 A ... 25.5 A.

2.2 Output process data (PDout)

Communication direction: IO-Link master to IO-Link device

NOTE

In the IO-Link master-to-IO-Link device communication direction, you can make the following settings on a channel-by-channel basis using the cyclic output process data (PDout): channel status after reset, tripping current INom, enabling or disabling the priority-controlled channel shutdown

	DPOut	Valid flag	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Channel status after reset
Byte 0	Bit	55	54	53	52	51	50	49	48
	Subindex	--	--	--	--	--	--	--	2

	DPOut	Reserved	Reserved	Nominal current, channel 1*			Nominal current, channel 2*		
Byte 1	Bit	47	46	45	44	43	42	41	40
	Subindex	--	--	3			4		

	DPOut	Reserved	Reserved	Nominal current, channel 3*			Nominal current, channel 4*		
Byte 2	Bit	39	38	37	36	35	34	33	32
	Subindex	--	--	5			6		

	DPOut	Reserved	Reserved	Nominal current, channel 5*			Nominal current, channel 6*		
Byte 3	Bit	31	30	29	28	27	26	25	24
	Subindex	--	--	7			8		

	DPOut	Reserved	Reserved	Nominal current, channel 7*			Nominal current, channel 8*		
Byte 4	Bit	23	22	21	20	19	18	17	16
	Subindex	--	--	9			10		

	DPOut	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Setting the prioritization
Byte 5	Bit	15	14	13	12	11	10	9	8
	Subindex	--	--	--	--	--	--	--	11

	DPOut	CH1 ON/OFF/RST	CH2 ON/OFF/RST	CH3 ON/OFF/RST	CH4 ON/OFF/RST	CH5 ON/OFF/RST	CH6 ON/OFF/RST	CH7 ON/OFF/RST	CH8 ON/OFF/RST
Byte 6	Bit	7	6	5	4	3	2	1	0
	Subindex	12	13	14	15	16	17	18	19

NOTE*

Valid values for these fields are 0hex ... 6hex (1 A ... 10 A). The value 7hex is set to 0hex (1 A).

Example	PDout = 81 2D 2D 2D 2D 00 FFhex PDout valid, all channels are initially switched off after a restart, all eight INom 8 A tripping currents are set and switched on

NOTE*
Valid values for these fields are 0hex ... 6hex (1 A ... 10 A).
The value 7hex is set to 0hex (1 A).

Validity of PDout (valid flag)	If the most significant bit (MSB) of the IO-Link master is changed from byte 0 to 1, the IO-Link device (power supply) recognizes the output process data (PDout) as valid. In the case of a 0 in the MSB, the received output process data (PDout) is ignored.
Channel status after reset	The channel status after reset is transmitted in one bit and describes the status of the channels after a restart. 0: State of charge before last switch-off, 1: All channels off
Setting the prioritization	Prioritized channel shutdown is performed when there is a risk of a device overload. It is transmitted in one bit and corresponds to the current status of the power supply: 0: Automatic; in case of power supply overload, the channel with the highest load current is switched off, 1: In case of power supply overload, the channel with the lowest priority (e. g. CH4 resp. CH8) is switched off.
Switching channel	To switch on a channel, 1 is written to the associated bit. If 0 is written, the channel is switched off. If several channels are switched on at the same time, a cascaded approach is used. The interval between the individual switch-on processes is 100 ms. 0: Switch off the channel, 1: Switch on the channel

3 Acyclic status information

3.1 IO-Link-specific data

Index	Subindex	Name	Description	Access rights	Length in bytes	Value range	Comment
02hex 2dec	0	System command	Restart device	WO	1	80hex	Command
			Reset application		1	81hex	
			Restore delivery state		1	82hex	
			Back to box		1	83hex	
0Chex 12dec	0	Device access lock	Local parameterization lock	RW	2	Bit offset 2	0: Unlocked 1: Locked
			Local user interface lock			Bit offset 3	0: Unlocked 1: Locked
10hex 16dec	0	Manufacturer name	--	RO	15	--	--
11hex 17dec	0	Manufacturer text	Manufacturer URL		21		
12hex 18dec	0	Product name	--		27		
13hex 19dec	0	Product ID	Item number		7		
14hex 20dec	0	Product text	--		7		
15hex 21dec	0	Serial number			11		
16hex 22dec	0	Hardware version			2		
17hex 23dec	0	Firmware version			8		
18hex 24dec	0	Application-specific identification		RW	32		
19hex 25dec	0	Function identification			32		
1Ahex 26dec	0	Location identification			32		

3.2 Manufacturer data

Index	Subindex	Name	Description	Access rights	Length in bytes	Value [unit]	Comment
41hex 65dec	0	Manufacturer data	Information gathered from subindex 1 to 7	RO	95	--	--
	1		Street		17		
	2		ZIP code		5		
	3		City		8		
	4		State		19		
	5		Country		2		
	6		Link to the homepage		40		
	7		Production date		4		

3.3 Operating data

Index	Subindex	Bit offset	Name	Description	Access rights	Length in bytes	Value [unit]	Resolution
60hex 96dec	0	--	Device-specific status	All parameters	RO	7	--	--
	1	52		Status of output voltage UOut		1	0: UOut <21 V DC 1: UOut >21 V DC	
	2	51		Status of output power POut		1	0: POut <90% 1: POut >90%	
	3	50		Status of operating hours		1	Operating time 0: <Threshold value 1: Threshold value	
	4	49		Reserved		1	--	
	5	48		Status of surge protection (OVP)		1	0: OVP not active 1: OVP active	
	6	16		Total operating hours		4	[h]	0.1
	7	0		Operating hours since last start		2	[h]	0.1
62hex 98dec	0	--	Output status	All parameters		4	--	--
	1	16		Output voltage		2	[V]	0.1
	2	0		Sum of outputs		2	[A]	0.1

3.4 Signaling data

Index	Subindex	Bit offset		Name	Description	Access rights	Length in bytes	Value [unit]	Resolution
		4C	8C						
63hex 99dec	0	--	--	IO status	All parameters	RO	12	4-channel	--
							16	8-channel	
	1	95	127		Relay contact 13/14 (DC OK)		1	Contact 0: Opened 1: Closed	
	2	88	120		LED1 (DC OK)		1	LED 0: Off 1: Green 2: Yellow 3: Red 4: Flashing red	
	3	80	112		LED2 (bargraph 1 A)		1	LED 0: Off 1: On	
	4	72	104		LED3 (bargraph 2 A)		1		
	5	64	96		LED4 (bargraph 3.8 A)		1		
	6	56	88		LED5 (bargraph 4 A)		1		
	7	48	80		LED6 (bargraph 6 A)		1		
	8	40	72		LED7 (bargraph 8 A)		1		
	9	32	64		LED8 (bargraph 10 A)		1		
	10	24	56		LED9 (channel 1)		1	LED 0: Off 1: Green 2: Yellow 3: Red 4: Flashing red/yellow 5: Flashing red 6: Flashing yellow	
	11	16	48		LED10 (channel 2)		1		
	12	8	40		LED11 (channel 3)		1		
	13	0	32		LED12 (channel 4)		1		
	14	--	24		LED13 (channel 5)		1		
	15	--	16		LED14 (channel 6)		1		
	16	--	8		LED15 (channel 7)		1		
	17	--	0		LED16 (channel 8)		1		
	18	94	126		LED17 (IO-Link Com)		1	LED 0: Off 1: On	
64hex 100dec	0	--	--	Static data	All parameters	RO	14	--	--
	1	96	96		Min. output voltage UOut		2	[V]	0.01
	2	80	80		Max. output voltage UOut		2		
	3	64	64		Max. output current INom >10 s		2	[A]	0.01
	4	48	48		Max. output current IDyn		2		
	5	32	32		Counter for surge protection (OVP)		2	0 ... 65535	--
	6	16	16		Counter for dynamic boost		2		
	7	0	0		Counter for power supply device starts		2		

3.5 Configuration

Index	Subindex	Bit offset	Name	Description	Access rights	Length in bytes	Value [unit]	Resolution
82hex 130dec	0	--	Power supply output parameters	All parameters	RW	3	--	--
	1	8		Output voltage UOut		2	[V]	0.01
	2	0		Internal output voltage switch-off		1	0: PS ON 1: PS OFF	--
83hex 131dec	0	--	IO configuration	All parameters		5	--	
	1	38		Enable relay contact		1	0: Disabled 1: Enabled	
	2	37		Enable DC OK signal		1		
	3	36		Enable IOut >90% signal		1		
	4	35		Reserved		1	--	
	5	34		Enable operating time > threshold value signal		1	0: Disabled 1: Enabled	
	6	33		Enable channel tripped signal		1		
	7	32		Enable channel defective signal		1		
	8	0		Operating time threshold value		4	0 ... 1600000 h	1

3.6 Output data of electronic device circuit breaker

Index	Subindex	Bit offset		Name	Description	Access rights	Length in bytes	Value [unit]	Resolution
		4C	8C						
1060hex 4192dec	0	--	--	Device-specific status of device circuit breaker	All parameters	RO	5	4-channel	--
							9	8-channel	
	1	32	64		Output current IOut, channel 1		1	[A]	0.1
	2	24	56		Output current IOut, channel 2		1		
	3	16	48		Output current IOut, channel 3		1		
	4	8	40		Output current IOut, channel 4		1		
	5	--	32		Output current IOut, channel 5		1		
	6	--	24		Output current IOut, channel 6		1		
	7	--	16		Output current IOut, channel 7		1		
	8	--	8		Output current IOut, channel 8		1		
	9	0	0		Threshold value IOut, channel 1		1	0: IOut <80% 1: IOut >80%	--
	10	1	1		Threshold value IOut, channel 2				
	11	2	2		Threshold value IOut, channel 3				
	12	3	3		Threshold value IOut, channel 4				
	13	--	4		Threshold value IOut, channel 5				
	14	--	5		Threshold value IOut, channel 6				
	15	--	6		Threshold value IOut, channel 7				
	16	--	7		Threshold value IOut, channel 8				
1070hex 4208dec	0	--	--		All parameters		8	4-channel	--
							16	8-channel	
	1	48	112		Output voltage UOut, channel 1		2	[V]	0.1
	2	32	96		Output voltage UOut, channel 2		2		
	3	16	80		Output voltage UOut, channel 3		2		
	4	0	64		Output voltage UOut, channel 4		2		
	5	--	48		Output voltage UOut, channel 5		2		
	6	--	32		Output voltage UOut, channel 6		2		
	7	--	16		Output voltage UOut, channel 7		2		
	8	--	0		Output voltage UOut, channel 8		2		

3.7 Configuration of electronic device circuit breaker

Index	Subindex	Bit offset		Name	Description	Access rights	Length in bytes	Value [unit]	Resolution
		4C	8C						
1080hex 4224dec	0	--	--	Device-specific status of device circuit breaker	All parameters	RW	5	4-channel	--
							9	8-channel	
	1	39	71		Channel status after reset		1	0: Restore status 1: All channels off	
	2	32	64		Nominal current INom channel 1		1	0: 1 A* 1: 2 A* 3: 3.8 A* 3: 4 A 4: 6 A 5: 8 A 6: 10 A	
	3	24	56		Nominal current INom channel 2		1		
	4	16	48		Nominal current INom channel 3		1		
	5	8	40		Nominal current INom channel 4		1		
	6	--	32		Nominal current INom channel 5		1		
	7	--	24		Nominal current INom channel 6		1		
	8	--	16		Nominal current INom channel 7		1		
	9	--	8		Nominal current INom channel 8		1		
	10	38	70		Priority for total current switch-off		1	0: Automatic (highest measured current first) 1: Highest channel number first	
	11	7	7		Channel 1 ON/OFF/RST		1	0: Off 1: On/Reset	
	12	6	6		Channel 2 ON/OFF/RST		1		
	13	5	5		Channel 3 ON/OFF/RST		1		
	14	4	4		Channel 4 ON/OFF/RST		1		
	15	--	3		Channel 5 ON/OFF/RST		1		
	16	--	2		Channel 6 ON/OFF/RST		1		
	17	--	1		Channel 7 ON/OFF/RST		1		
	18	--	0		Channel 8 ON/OFF/RST		1		

*NEC Class 2 Output

3.8 Event status

Index	Subindex	Bit offset	Description	Access rights	Lenght Byte	Comment
80hex 128dec	0	--	All events	RW	5	--
	1	32	DC not OK		1	0: Event acknowledged 1: Event occurred Subindex 0: Bit set to 1 Subindex 1 ... 39: Value FFhex is displayed
	2	33	PDyn >90%		1	
	3	38	Reserved		1	
	4	16	Short circuit, channel 1		1	
	5	17	Short circuit, channel 2		1	
	6	18	Short circuit, channel 3		1	
	7	19	Short circuit, channel 4		1	
	8	20	Short circuit, channel 5		1	
	9	21	Short circuit, channel 6		1	
	10	22	Short circuit, channel 7		1	
	11	23	Short circuit, channel 8		1	
	12	24	Overload, channel 1		1	
	13	25	Overload, channel 2		1	
	14	26	Overload, channel 3		1	
	15	27	Overload, channel 4		1	
	16	28	Overload, channel 5		1	
	17	29	Overload, channel 6		1	
	18	30	Overload, channel 7		1	
	19	31	Overload, channel 8		1	
	20	35	Total current switch-off as priority setting		1	
	21	0	Defect in output path, channel 1		1	
	22	1	Defect in output path, channel 2		1	
	23	2	Defect in output path, channel 3		1	
	24	3	Defect in output path, channel 4		1	
	25	4	Defect in output path, channel 5		1	
	26	5	Defect in output path, channel 6		1	
	27	6	Defect in output path, channel 7		1	
	28	7	Defect in output path, channel 8		1	
	29	34	Power supply failed (power supply unit / communication module)		1	
	30	8	Difference between UOut power supply channel 1 and device circuit breaker		1	
	31	9	Difference between UOut power supply channel 2 and device circuit breaker		1	
	32	10	Difference between UOut power supply channel 3 and device circuit breaker		1	
	33	11	Difference between UOut power supply channel 4 and device circuit breaker		1	
	34	12	Difference between UOut power supply channel 5 and device circuit breaker		1	
	35	13	Difference between UOut power supply channel 6 and device circuit breaker		1	
	36	14	Difference between UOut power supply channel 7 and device circuit breaker		1	
	37	15	Difference between UOut power supply channel 8 and device circuit breaker		1	
	38	36	Difference between IOut power supply and total current of all channels		1	
	39	37	All channels are switched off / faulty differential current measurement		1	

3.9 Event code

Code (hex)	Description	Type
1800	DC not OK	Warning
1801	PDyn >90%	
1803	Short circuit, channel 1	
1804	Short circuit, channel 2	
1805	Short circuit, channel 3	
1806	Short circuit, channel 4	
1807	Short circuit, channel 5	
1808	Short circuit, channel 6	
1809	Short circuit, channel 7	
180A	Short circuit, channel 8	
180B	Overload, channel 1	
180C	Overload, channel 2	
180D	Overload, channel 3	
180E	Overload, channel 4	
181F	Overload, channel 5	
1810	Overload, channel 6	
1811	Overload, channel 7	
1812	Overload, channel 8	
1813	Total current monitoring, total current exceeded, shut down channels according to priority	
1814	Defect in output path, channel 1	Error
1815	Defect in output path, channel 2	
1816	Defect in output path, channel 3	
1817	Defect in output path, channel 4	
1818	Defect in output path, channel 5	
1819	Defect in output path, channel 6	
181A	Defect in output path, channel 7	
181B	Defect in output path, channel 8	
181C	Power supply failed (power supply unit / communication lost)	
181D	Difference between UOut power supply channel 1 and device circuit breaker	Warning
181E	Difference between UOut power supply channel 2 and device circuit breaker	
181F	Difference between UOut power supply channel 3 and device circuit breaker	
1820	Difference between UOut power supply channel 4 and device circuit breaker	
1821	Difference between UOut power supply channel 5 and device circuit breaker	
1822	Difference between UOut power supply channel 6 and device circuit breaker	
1823	Difference between UOut power supply channel 7 and device circuit breaker	
1824	Difference between UOut power supply channel 8 and device circuit breaker	
1825	Difference between IOut power supply and total current of all channels	Error
1826	All channels are switched off / faulty differential current measurement	