K50 Pro Touch Display IO-Link Data Reference Guide

IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-K50PTCD-20211027-IODD1.1.xml. The IODD file and support files can be found on www.bannerengineering.com under the download section of the product family page.

Communication Parameters

The following communication parameters are used.

Parameter	Value
IO-Link revision	V1.1
Process Data In length	2-bytes
Process Data Out length	19-bytes
Bit Rate	38400 bps
Minimum cycle time	5 ms

Parameter	Value
Port class	A
SIO mode	No
Smart sensor profile	N/A
Block parameterization	Yes
Data Storage	Yes

IO-Link Process Data In (Device to Master)

Subindex	Name	Number of Bits	Data Values
1	Output State Area 1	1	0 = Inactive, 1 = Active
2	Output State Area 2	1	0 = Inactive, 1 = Active
3	State	2	0 = State 1, 1 = State 2, 2 = State 3, 3 = State 4, 4 = State 5 [1]

Example Process Data In

Segment Mode Example Process Data Out								
Octet 0								
Bit offset	15	14	13	12	11	10	9	8
Subindex	-	-	-	-	-	3		
Value						0	0	1
Example						State: State 2		
Octet 1								
Bit offset	7	6	5	4	3	2	1	0
Subindex	-	-	-	-	-	-	2	1
Value							0	1
Example							Output State Area 2: Inactive	Output State Area 1: Active

IO-Link Process Data Out (Master to Device)

Multicolor Mode

Multicolor Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	State	3	0 = State 1 1 = State 2 2 = State 3 3 = State 4 4 = State 5

[1] Subindex 3 does not apply for Advanced or LED Control Modes

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ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

Multicolor Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
2	Number	16	-
3	String (ASCII)	8	-

Multicolor Mode Example Process Data Out

Octet 0								
Bit offset	151	150	149	148	147	146	145	144
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 1								
Bit offset	143	142	141	140	139	138	137	136
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 2								
Bit offset	135	134	133	132	131	130	129	128
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 3								
Bit offset	127	126	125	124	123	122	121	120
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 4								
Bit offset	119	118	117	116	115	114	113	112
Subindex	3							
Value	0	1	0	1	0	0	1	1
Example	String (ASCII): S							
Octet 5								
Bit offset	111	110	109	108	107	106	105	104
Subindex	3							
Value	0	1	1	1	0	1	0	0
Example	String (ASCII): t							
Octet 6								
Bit offset	103	102	101	100	99	98	97	96
Subindex	3							
Value	0	1	0	0	1	1	1	1
Example	String (ASCII): O							
Octet 7								
Bit offset	95	94	93	92	91	90	89	88
Subindex	3							
Value	0	1	0	1	1	0	1	0
Example	String (ASCII): P							

Octet 8								
Bit offset	87	86	85	84	83	82	81	80
Subindex	2							
Value	0	0	0	0	0	0	0	0
Example	Value: 15							
Octet 9								
Bit offset	79	78	77	76	75	74	73	72
Subindex	2							
Value	0	0	0	0	1	1	1	1
Example	Value: 15							
Octet 10								
Bit offset	71	70	69	68	67	66	65	64
Subindex	-	-	-	-	-	-	-	-
Octet 11								
Bit offset	63	62	61	60	59	58	57	56
Subindex	-	-	-	-	-	-	-	-
Octet 12								
Bit offset	55	54	53	52	51	50	49	48
Subindex	-	-	-	-	-	-	-	-
Octet 13								
Bit offset	47	46	45	44	43	42	41	40
Subindex	-	-	-	-	-	-	-	-
Octet 14								
Bit offset	39	38	37	36	35	34	33	32
Subindex	-	-	-	-	-	-	-	-
Octet 15								
Bit offset	31	30	29	28	27	26	25	24
Subindex	-	-	-	-	-	-	-	-
Octet 16								
Bit offset	23	22	21	20	19	18	17	16
Subindex	-	-	-	-	-	-	-	-
Octet 17								
Bit offset	15	14	13	12	11	10	9	8
Subindex	-	-	-	-	-	-	-	-
Octet 18								
Bit offset	7	6	5	4	3	2	1	0
Subindex	-	-	-	-	-	1		
Value	-	-	-	-	-	0	0	1
Example	-	-	-	-	-	State: State 2		

Four State Full Logic Mode

Four State Full Logic Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	State	3	0 = State 1 1 = State 2 2 = State 3 3 = State 4 4 = State 5
2	Number	16	-
3	String (ASCII)	8	-

Four State Full Logic Mode Example Process Data Out

Octet 0								
Bit offset	151	150	149	148	147	146	145	144
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 1								
Bit offset	143	142	141	140	139	138	137	136
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 2								
Bit offset	135	134	133	132	131	130	129	128
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 3								
Bit offset	127	126	125	124	123	122	121	120
Subindex	3							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 4								
Bit offset	119	118	117	116	115	114	113	112
Subindex	3							
Value	0	1	0	1	0	0	1	1
Example	String (ASCII): S							
Octet 5								
Bit offset	111	110	109	108	107	106	105	104
Subindex	3							
Value	0	1	1	1	0	1	0	0
Example	String (ASCII): t							
Octet 6								
Bit offset	103	102	101	100	99	98	97	96
Subindex	3							
Value	0	1	0	0	1	1	1	1
Example	String (ASCII): O							

Octet 7								
Bit offset	95	94	93	92	91	90	89	88
Subindex	3							
Value	0	1	0	1	1	0	1	0
Example	String (ASCII): P							
Octet 8								
Bit offset	87	86	85	84	83	82	81	80
Subindex	2							
Value	0	0	0	0	0	0	0	0
Example	Value: 15							
Octet 9								
Bit offset	79	78	77	76	75	74	73	72
Subindex	2							
Value	0	0	0	0	1	1	1	1
Example	Value: 15							
Octet 10								
Bit offset	71	70	69	68	67	66	65	64
Subindex	-	-	-	-	-	-	-	-
Octet 11								
Bit offset	63	62	61	60	59	58	57	56
Subindex	-	-	-	-	-	-	-	-
Octet 12								
Bit offset	55	54	53	52	51	50	49	48
Subindex	-	-	-	-	-	-	-	-
Octet 13								
Bit offset	47	46	45	44	43	42	41	40
Subindex	-	-	-	-	-	-	-	-
Octet 14								
Bit offset	39	38	37	36	35	34	33	32
Subindex	-	-	-	-	-	-	-	-
Octet 15								
Bit offset	31	30	29	28	27	26	25	24
Subindex	-	-	-	-	-	-	-	-
Octet 16								
Bit offset	23	22	21	20	19	18	17	16
Subindex	-	-	-	-	-	-	-	-
Octet 17								
Bit offset	15	14	13	12	11	10	9	8
Subindex	-	-	-	-	-	-	-	-
Octet 18								
Bit offset	7	6	5	4	3	2	1	0
Subindex	-	-	-	-	-	1		
Value	-	-	-	-	-	-	-	0
Example	-	-	-	-	-	State: State 1		

Advanced Mode

Advanced Mode				
Subindex	**Name**	**Number of Bits**	**Data Values**	
1	Animation Type	4	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = 50/50 5 = 50/50 Rotate 6 = Chase 7 = Intensity Sweep	8 = Color Sweep 9 = Sequence 10 = Wave 11 = Double Wave 12 = Steady Area 1 13 = Steady Area 2 14 = Alternate Area 1/Area 2
2	Animation Direction	1	0 = CCW, 1 = CW	
3	Animation Pattern	3	0 = Flash, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	
4	Animation Speed	2	0 = Slow, 1 = Medium, 2 = Fast, 3 = Custom	
7	Dynamic Sequence Value	8	0-255	
8	Sequence Start Location	3	0 = LED1 1 = LED2 2 = LED3 3 = LED4	4 = LED5 5 = LED6 6 = LED7 7 = LED8
9	Color 1	5	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan	8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
10	Color 1 Intensity	3	0 = High, 1 = Medium, 2 = Low, 3 = Off, 4 = Custom	
11	Color 2	5	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan	8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
12	Color 2 Intensity	3	0 = High, 1 = Medium, 2 = Low, 3 = Off, 4 = Custom	
13	Number	16	-	
14	String (ASCII)	8	-	

Advanced Mode Example Process Data Out

Octet 0								
Bit offset	151	150	149	148	147	146	145	144
Subindex	14							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 1								
Bit offset	143	142	141	140	139	138	137	136
Subindex	14							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 2								
Bit offset	135	134	133	132	131	130	129	128
Subindex	14							
Value	0	0	0	0	0	0	0	0

Octet 2								
Example	String (ASCII): -							
Octet 3								
Bit offset	127	126	125	124	123	122	121	120
Subindex	14							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 4								
Bit offset	119	118	117	116	115	114	113	112
Subindex	14							
Value	0	1	0	1	0	0	1	1
Example	String (ASCII): S							
Octet 5								
Bit offset	111	110	109	108	107	106	105	104
Subindex	14							
Value	0	1	1	1	0	1	0	0
Example	String (ASCII): t							
Octet 6								
Bit offset	103	102	101	100	99	98	97	96
Subindex	14							
Value	0	1	0	0	1	1	1	1
Example	String (ASCII): O							
Octet 7								
Bit offset	95	94	93	92	91	90	89	88
Subindex	14							
Value	0	1	0	1	1	0	1	0
Example	String (ASCII): P							
Octet 8								
Bit offset	87	86	85	84	83	82	81	80
Subindex	13							
Value	0	0	0	0	0	0	0	0
Example	Value: 15							
Octet 9								
Bit offset	79	78	77	76	75	74	73	72
Subindex	13							
Value	0	0	0	0	1	1	1	1
Example	Value: 15							
Octet 10								
Bit offset	71	70	69	68	67	66	65	64
Subindex	-	-	-	-	-	-	-	-
Octet 11								
Bit offset	63	62	61	60	59	58	57	56
Subindex	12			11				
Value	0	0	0	0	0	0	0	1
Example	Color 2 Intensity: High			Color 2: Red				
Octet 12								
Bit offset	55	54	53	52	51	50	49	48

Octet 12								
Subindex	10			9				
Value	0	0	0	0	0	0	0	0
Example	Color 1 Intensity: High			Color 1: Green				
Octet 13								
Bit offset	47	46	45	44	43	42	41	40
Subindex	-	-	-	-	-	8		
Value	-	-	-	-	-	0	0	1
Example	-	-	-	-	-	Sequence Start Location: 1		
Octet 14								
Bit offset	39	38	37	36	35	34	33	32
Subindex	7							
Value	1	0	0	1	0	1	1	0
Example	Dynamic Sequence Value: 150							
Octet 15								
Bit offset	31	30	29	28	27	26	25	24
Subindex	-	-	-	-	-	-	-	-
Octet 16								
Bit offset	23	22	21	20	19	18	17	16
Subindex	-	-	-	-	-	-	-	-
Octet 17								
Bit offset	15	14	13	12	11	10	9	8
Subindex	-	-	-	-	-	-	4	
Value	-	-	-	-	-	-	0	0
Example	-	-	-	-	-	-	Animation Speed: Slow	
Octet 18								
Bit offset	7	6	5	4	3	2	1	0
Subindex	3			2	1			
Value	0	0	0	0	0	0	0	1
Example	Animation Pattern: Flash			Animation Direction: CCW	Animation Type: Steady			

LED Control Mode

LED Control Mode				
Subindex	**Name**	**Number of Bits**	**Data Values**	
1	LED 1 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan	8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
2	LED 1 Intensity (0-10)	4	0-10 = 0-100%	
3	LED 2 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan	8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2

LED Control Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
4	LED 2 Intensity (0-10)	4	0-10 = 0-100%
5	LED 3 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
6	LED 3 Intensity (0-10)	4	0-10 = 0-100%
7	LED 4 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
8	LED 4 Intensity (0-10)	4	0-10 = 0-100%
9	LED 5 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
10	LED 5 Intensity (0-10)	4	0-10 = 0-100%
11	LED 6 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
12	LED 6 Intensity (0-10)	4	0-10 = 0-100%
13	LED 7 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
14	LED 7 Intensity (0-10)	4	0-10 = 0-100%
15	LED 8 Color	4	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2
16	LED 8 Intensity (0-10)	4	0-10 = 0-100%
17	Number	16	-
18	String (ASCII)	8	-

LED Control Mode Example Process Data Out

Octet 0								
Bit offset	151	150	149	148	147	146	145	144
Subindex	18							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 1								
Bit offset	143	142	141	140	139	138	137	136
Subindex	18							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 2								
Bit offset	135	134	133	132	131	130	129	128
Subindex	18							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 3								
Bit offset	127	126	125	124	123	122	121	120
Subindex	18							
Value	0	0	0	0	0	0	0	0
Example	String (ASCII): -							
Octet 4								
Bit offset	119	118	117	116	115	114	113	112
Subindex	18							
Value	0	1	0	1	0	0	1	1
Example	String (ASCII): S							
Octet 5								
Bit offset	111	110	109	108	107	106	105	104
Subindex	18							
Value	0	1	1	1	0	1	0	0
Example	String (ASCII): t							
Octet 6								
Bit offset	103	102	101	100	99	98	97	96
Subindex	18							
Value	0	1	0	0	1	1	1	1
Example	String (ASCII): O							
Octet 7								
Bit offset	95	94	93	92	91	90	89	88
Subindex	18							
Value	0	1	0	1	1	0	1	0
Example	String (ASCII): P							
Octet 8								
Bit offset	87	86	85	84	83	82	81	80
Subindex	17							
Value	0	0	0	0	0	0	0	0
Example	Value: 15							

Octet 9								
Bit offset	79	78	77	76	75	74	73	72
Subindex	17							
Value	0	0	0	0	1	1	1	1
Example	Value: 15							
Octet 10								
Bit offset	71	70	69	68	67	66	65	64
Subindex	-	-	-	-	-	-	-	-
Octet 11								
Bit offset	63	62	61	60	59	58	57	56
Subindex	16				15			
Value	0	1	0	1	0	0	0	0
Example	LED 8 Intensity: 5				LED Color 8: Green			
Octet 12								
Bit offset	55	54	53	52	51	50	49	48
Subindex	14				13			
Value	0	1	0	1	0	1	1	1
Example	LED 7 Intensity: 5				LED Color 7: Cyan			
Octet 13								
Bit offset	47	46	45	44	43	42	41	40
Subindex	12				11			
Value	0	1	0	1	0	0	0	0
Example	LED 6 Intensity: 5				LED Color 6: Green			
Octet 14								
Bit offset	39	38	37	36	35	34	33	32
Subindex	10				9			
Value	0	1	0	1	0	0	0	1
Example	LED 5 Intensity: 5				LED Color 5: Red			
Octet 15								
Bit offset	31	30	29	28	27	26	25	24
Subindex	8				7			
Value	0	1	0	1	0	0	1	0
Example	LED 4 Intensity: 5				LED Color 4: Orange			
Octet 16								
Bit offset	23	22	21	20	19	18	17	16
Subindex	6				5			
Value	0	1	0	1	0	0	1	0
Example	LED 3 Intensity: 5				LED Color 3: Orange			
Octet 17								
Bit offset	15	14	13	12	11	10	9	8
Subindex	4				3			
Value	0	1	0	1	0	0	0	1
Example	LED 2 Intensity: 5				LED Color 2: Red			
Octet 18								
Bit offset	7	6	5	4	3	2	1	0
Subindex	2				1			
Value	0	1	0	1	0	0	0	0

Octet 18								
Example	LED 1 Intensity: 1				LED Color 1: Green			

Parameters Set Using IO-Link

These parameters can be read from and/or written to an IO-Link model of the K50 Pro Touch Display.

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
0	1-16	Direct Parameter Page 1 (incl. Vendor ID & Device ID)				rw		
1	1-16	Direct Parameters Page 2				rw		
2		Standard Command		130 = Restore Factory Settings		wo		
3-11								
12		**Device Access Locks**						
	1	Parameter (write) Access Lock	1	0 = off, 1 = on	0	rw	y	
	2	Data Storage Lock	1	0 = off, 1 = on	0	rw	y	
	3	Local Parameterization Lock	1	0 = off, 1 = on		rw	y	
	4	Local User Interface Lock	1	0 = off, 1 = on		rw	y	
13-15								
16		Vendor Name string		Banner Engineering Corporation		ro		
17		Vendor Text string		More Sensors. More Solutions.		ro		
18		Product Name string		K50 Pro Touch Display with IO-Link		ro		
19		Product ID string		K50PTCD4KQ[P]		ro		
20		Product Text string		K50 Pro Touch Display with IO-Link		ro		
21		Serial Number				ro		
22		Hardware Revision				ro		
23		Firmware Version				ro		
24		App Specific Tag (user defined)				rw	y	
25-35								
36		Device Status	8	0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure 5-255 = Reserved		ro		
37	1-6	Detailed Device Status	Array[6] of 3-octet			ro		
38-79								
80		Operating Mode	3	0 = Multicolor 1 = Four State Full Logic 2 = Advanced 3 = LED Control 4 = Demo	2	rw	y	
81		**Custom Animation Settings**						
	1	Custom Intensity (0 - 100%)	8	0-100	100	rw	y	
	2	Custom Flash Rate (0.5 - 25.5 Hz)	8	5-255	15	rw	y	
	3	Restrict To Gamut	8	0 = Off, 1 = On	0	rw	y	
82		**Input Settings**						
	1	Touch Sensitivity	2	0 = Low, 1 = Standard, 2 = High	1	rw	y	
	2	Function	1	0 = Momentary, 1 = Latched	0	rw	y	
	3	Mute Enable	1	0 = Off, 1 = On	0	rw	y	
	4	On Delay (ms)	8	0-65535	0	rw	y	
83		**Output Settings**						
	1	Output State	1	0 = Normally Closed, 1 = Normally Open	true	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	2	Off Delay Type	1	0 = Leading Edge, 1 = Trailing Edge	0	rw	y	
	3	Off Delay (ms)	16	0-65,535	0	rw	y	
84		**State 1 Parameters**						
	1	Animation Type	4	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = 50/50 5 = 50/50 Rotate 6 = Chase 7 = Intensity Sweep 8 = Color Sweep 9 = Sequence 10 = Wave 11 = Double Wave 12 = Steady Area 1 13 = Steady Area 2 14 = Alternate Area 1/Area 2	1	rw	y	
	2	Animation Direction	1	0 = CCW, 1 = CW	false	rw	y	
	3	Animation Pattern	3	0 = Flash, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	4	Animation Speed	2	0 = Slow, 1 = Medium, 2 = Fast, 3 = Custom	1	rw	y	
	5	Reserved	2		0	rw	y	
	6	Off Delay Type	1	0 = Leading Edge, 1 = Trailing Edge	false	rw	y	
	7	Off Delay (ms)	16	0-65535	0	rw	y	
	8	Static Sequence Value (0-225)	8	0-225	0	rw	y	
	9	Sequence Start Location	3	0 = LED1, 1 = LED2, 2 = LED3, 3 = LED4, 4 = LED5, 5 = LED6, 6 = LED7, 7 = LED8	0	rw	y	
	10	Color 1	5	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0	rw	y	
	11	Color 1 Intensity	3	0 = High, 1 = Medium, 2 = Low, 3 = Off, 4 = Custom	0	rw	y	
	12	Color 2	5	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0	rw	y	
	13	Color 2 Intensity	3	0 = High, 1 = Medium, 2 = Low, 3 = Off, 4 = Custom	0	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
85		State 2 Parameters (same structure as Index 84						
86		State 3 Parameters (same structure as Index 84)						
87		State 4 Parameters (same structure as Index 84)						
88		State 5 Parameters (same structure as Index 84)						
90		**Custom Color 1** (subindex access not supported)						
	1	Red	8	0-255	255	rw	y	
	2	Green	8	0-255	255	rw	y	
	3	Blue	8	0-255	255	rw	y	
91		**Custom Color 2** (subindex access not supported)						
	1	Red	8	0-255	255	rw	y	
	2	Green	8	0-255	255	rw	y	
	3	Blue	8	0-255	255	rw	y	
96		**Display Parameters**						
	1	Intensity	8	0 = Low, 1 = Medium, 2 = High, 3 = Ultra High	2			
	2	Orientation	8	0 = Standard, 1 = Flipped	0			
	3	Scroll Speed	8	0 = Off, 1 = Slow, 2 = Medium, 3 = Feast	2			
	4	Startup Message Type	8	0 = Off, 1 = Communication Parameters, 2 = Custom	1			
	5	Startup String Delay	16	0..65535	3000			
	6	Encoding	8	0 = ASCII, 1 = Numeric	0			
	7	Decimal Type	8	0 = Off, 1 = On, 2 = Flash, 3 = Communication, 4 = Power + Communication	0			
	8	Decimal Type	8	0 = Off, 1 = On, 2 = Flash, 3 = Communication, 4 = Power + Communication	0			
	9	Decimal Type	8	0 = Off, 1 = On, 2 = Flash, 3 = Communication, 4 = Power + Communication	0			
	10	Decimal Type	8	0 = Off, 1 = On, 2 = Flash, 3 = Communication, 4 = Power + Communication	4			
	11	Startup String	20-octet String US_ASCII					

IO-Link Events

Events and Error Types are acyclic transmissions from the IO-Link device to the IO-Link master. Events can be error messages and/or warning or maintenance data.

Event Types		
Code	**Type**	**Description**
0 (0x0000)	Notification	No malfunction
20480 (0x5000)	Error	Device hardware fault/Device exchange

Error Types			
Code	**Additional Code**	**Name**	**Description**
128 (0x80)	0 (0x00)	Device application error - no details	Service has been refused by the device application and no detailed information of the incident is available
	17 (0x11)	Index not available	Access occurs to a not existing device
	18 (0x12)	Subindex not available	Access occurs to a not existing subindex
	32 (0x20)	Service temporarily not available	Parameter is not accessible because of the current state of the device application
	35 (0x23)	Access denied	Write access on a read-only parameter

Error Types			
Code	**Additional Code**	**Name**	**Description**
	48 (0x30)	Parameter value out of range	Written parameter value is outside its permitted value range
	49 (0x31)	Parameter value above limit	Written parameter value is above its specific value limit
	51 (0x33)	Parameter length overrun	Written parameter length is above its predefined length
	52 (0x34)	Parameter length underrun	Written parameter length is below its predefined length
	53 (0x35)	Function not available	Written command is not supported by the device application
	54 (0x36)	Function temporarily unavailable	Written command is not available because of the current state of the device application
	65 (0x41)	Inconsistent parameter set	Parameter inconsistencies were found at the end of the block parameter transfer, device plausibility check failed

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