IO-Link Data Reference Guide: TL50 Pro

IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-TL50RGBIOL-20201026-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	V2.0
Process Data In length	N/A
Process Data Out length	31-bytes
Bit Rate	38400 bps
Minimum cycle time	20 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)

Not applicable.

IO-Link Process Data Out (Master to Device)

Basic Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Audible State	2	0 = Off, 1 = On, 2 = Pulsed, 3 = SOS Pulse
2	Segment 1	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
3	Segment 2	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
4	Segment 3	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
5	Segment 4	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
6	Segment 5	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
7	Segment 6	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
8	Segment 7	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
9	Segment 8	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
10	Segment 9	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation
11	Segment 10	2	0 = Off, 1 = On, 2 = Flash, 3 = Animation

Basic Mode Example Process Data Out

Octet 0								
Bit offset	247	246	245	244	243	242	241	240
Subindex	-	-	-	-	-	-	-	-

Octet 1								
Bit offset	239	238	237	236	235	234	233	232
Subindex	-	-	-	-	11		10	
Value					0	0	0	0
Example					Segment 10: Off		Segment 9: Off	

Octet 2								
Bit offset	231	230	229	228	227	226	225	224
Subindex	9		8		7		6	
Value	0	0	0	0	0	0	1	0
Example	Segment 8: Off		Segment 7: Off		Segment 6: Off		Segment 5: Flash	

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Octet 3								
Bit offset	223	222	221	220	219	218	217	216
Subindex	5		4		3		2	
Value	0	0	1	1	0	1	0	1
Example	Segment 4: Off		Segment 3: Animation		Segment 2: On		Segment 1: On	

Octet 4								
Bit offset	215	214	213	212	211	210	209	208
Subindex	-	-	-	-	-	-	-	-

Octet 5								
Bit offset	207	206	205	204	203	202	201	200
Subindex	-	-	-	-	-	-	1	
Value							1	0
Example							Audible State: Pulsed	

Advanced Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Segment 1 Color 1	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 = Custom 1, 15 = Custom 2
2	Segment 1 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
3	Segment 1 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
4	Segment 1 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
5	Segment 1 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
6	Segment 1 Color 2	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 = Custom 1, 15 = Custom 2
7	Segment 1 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
8	Segment 1 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
9	Segment 2 Color 1	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 = Custom 1, 15 = Custom 2
10	Segment 2 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
11	Segment 2 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
12	Segment 2 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
13	Segment 2 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
14	Segment 2 Color 2	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 = Custom 1, 15 = Custom 2
15	Segment 2 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
16	Segment 2 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
17	Segment 3 Color 1	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 = Custom 1, 15 = Custom 2
18	Segment 3 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
19	Segment 3 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
20	Segment 3 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
21	Segment 3 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
22	Segment 3 Color 2	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 = Custom 1, 15 = Custom 2
23	Segment 3 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
24	Segment 3 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
25	Segment 4 Color 1	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 = Custom 1, 15 = Custom 2
26	Segment 4 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
27	Segment 4 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
28	Segment 4 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
29	Segment 4 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
30	Segment 4 Color 2	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 = Custom 1, 15 = Custom 2
31	Segment 4 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
32	Segment 4 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise

Advanced Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
33	Segment 5 Color 1	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 = Custom 1, 15 = Custom 2
34	Segment 5 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
35	Segment 5 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
36	Segment 5 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
37	Segment 5 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
38	Segment 5 Color 2	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 = Custom 1, 15 = Custom 2
39	Segment 5 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
40	Segment 5 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
41	Segment 6 Color 1	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 = Custom 1, 15 = Custom 2
42	Segment 6 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
43	Segment 6 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
44	Segment 6 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
45	Segment 6 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
46	Segment 6 Color 2	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 = Custom 1, 15 = Custom 2
47	Segment 6 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
48	Segment 6 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
49	Segment 7 Color 1	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 = Custom 1, 15 = Custom 2
50	Segment 7 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
51	Segment 7 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
52	Segment 7 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
53	Segment 7 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
54	Segment 7 Color 2	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 = Custom 1, 15 = Custom 2
55	Segment 7 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
56	Segment 7 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
57	Segment 8 Color 1	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 = Custom 1, 15 = Custom 2
58	Segment 8 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
59	Segment 8 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
60	Segment 8 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
61	Segment 8 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
62	Segment 8 Color 2	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 = Custom 1, 15 = Custom 2
63	Segment 8 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
64	Segment 8 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
65	Segment 9 Color 1	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 = Custom 1, 15 = Custom 2
66	Segment 9 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
67	Segment 9 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
68	Segment 9 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
69	Segment 9 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
70	Segment 9 Color 2	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 = Custom 1, 15 = Custom 2
71	Segment 9 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
72	Segment 9 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
73	Segment 10 Color 1	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 = Custom 1, 15 = Custom 2
74	Segment 10 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
75	Segment 10 Animation Type	3	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep
76	Segment 10 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom
77	Segment 10 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
78	Segment 10 Color 2	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 = Custom 1, 15 = Custom 2
79	Segment 10 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom

Advanced Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
80	Segment 10 Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
81	Audible State	2	0 = Off, 1 = On, 2 = Pulsed, 3 = SOS Pulse

Advanced Mode Example Process Data Out

Octet 0								
Bit offset	247	246	245	244	243	242	241	240
Subindex	-	-	-	-	-	-	81	
Value							0	0
Example							Audible State: Normal	

Octet 1								
Bit offset	239	238	237	236	235	234	233	232
Subindex	80	79			78			
Value	0	0	0	0	0	0	0	0
Example	Segment 10 Rotate: CCW	Segment 10 Color 2 Intensity: High			Segment 10 Color 2: Green			

Octet 2								
Bit offset	231	230	229	228	227	226	225	224
Subindex	77			76		75		
Value	0	0	0	0	0	1	1	1
Example	Segment 10 Pulse Pattern: Normal			Segment 10 Speed: High		Segment 10 Animation Type: Intensity Sweep		

Octet 3								
Bit offset	223	222	221	220	219	218	217	216
Subindex	-	74			73			
Value		0	1	0	0	0	1	0
Example		Segment 10 Color 1 Intensity: Medium			Segment 10 Color 1: Orange			

Octet 4								
Bit offset	215	214	213	212	211	210	209	208
Subindex	72	71			70			
Value	0	0	1	0	1	1	0	0
Example	Segment 9 Rotate: CCW	Segment 9 Color 2 Intensity: Medium			Segment 9 Color 2: Rose			

Octet 5								
Bit offset	207	206	205	204	203	202	201	200
Subindex	69			68		67		
Value	0	1	0	1	0	0	1	1
Example	Segment 9 Pulse Pattern: Three Pulse			Segment 9 Speed: Slow		Segment 9 Animation Type: Two color flash		

Octet 6								
Bit offset	199	198	197	196	195	194	193	192
Subindex	-	66			65			
Value		0	0	0	0	1	1	0
Example		Segment 9 Color 1 Intensity: High			Segment 9 Color 1: Spring Green			

Octet 7								
Bit offset	191	190	189	188	187	186	185	184
Subindex	64	63			62			
Value	0	0	0	0	0	0	0	0

Octet 7								
Example	Segment 8 Rotate: CCW	Segment 8 Color 2 Intensity: High			Segment 8 Color 2: Green			

Octet 8								
Bit offset	183	182	181	180	179	178	177	176
Subindex	61			60		59		
Value	0	0	0	0	1	0	0	1
Example	Segment 8 Pulse Pattern: Normal			Segment 8 Speed: High		Segment 8 Animation Type: Steady		

Octet 9								
Bit offset	175	174	173	172	171	170	169	168
Subindex	-	58			57			
Value		0	0	0	1	0	1	0
Example		Segment 8 Color 1 Intensity: High			Segment 8 Color 1: Violet			

Octet 10								
Bit offset	167	166	165	164	163	162	161	160
Subindex	56	55			54			
Value	0	0	0	0	1	1	0	1
Example	Segment 7 Rotate: CCW	Segment 7 Color 2 Intensity: High			Segment 7 Color 2: White			

Octet 11								
Bit offset	159	158	157	156	155	154	153	152
Subindex	53			52		51		
Value	0	0	0	0	0	1	1	0
Example	Segment 7 Pulse Pattern: Normal			Segment 7 Speed: Medium		Segment 7 Animation Type: Chase		

Octet 12								
Bit offset	151	150	149	148	147	146	145	144
Subindex	-	50			49			
Value		0	0	1	0	1	0	1
Example		Segment 7 Color 1 Intensity: Low			Segment 7 Color 1: Lime Green			

Octet 13								
Bit offset	143	142	141	140	139	138	137	136
Subindex	48	47			46			
Value	1	0	1	0	1	0	1	1
Example	Segment 6 Rotate: CW	Segment 6 Color 2 Intensity: Medium			Segment 6 Color 2: Magenta			

Octet 14								
Bit offset	135	134	133	132	131	130	129	128
Subindex	45			44		43		
Value	0	0	0	1	0	1	0	1
Example	Segment 6 Pulse Pattern: Normal			Segment 6 Speed: Slow		Segment 6 Animation Type: 50/50 Rotate		

Octet 15								
Bit offset	127	126	125	124	123	122	121	120
Subindex	-	42			41			
Value		0	0	0	0	1	1	1
Example		Segment 6 Color 1 Intensity: High			Segment 6 Color 1: Cyan			

Octet 16								
Bit offset	119	118	117	116	115	114	113	112
Subindex	40	39			38			
Value	0	0	0	0	0	0	0	0
Example	Segment 5 Rotate: CCW	Segment 5 Color 2 Intensity: High			Segment 5 Color 2: Green			

Octet 17								
Bit offset	111	110	109	108	107	106	105	104
Subindex	37			36		35		
Value	0	1	1	0	0	0	1	0
Example	Segment 5 Pulse Pattern: SOS			Segment 5 Speed: Medium		Segment 5 Animation Type: Flash		

Octet 18								
Bit offset	103	102	101	100	99	98	97	96
Subindex	-	34			33			
Value		0	0	0	0	0	0	1
Example		Segment 5 Color 1 Intensity: High			Segment 5 Color 1: Red			

Octet 19								
Bit offset	95	94	93	92	91	90	89	88
Subindex	32	31			30			
Value	0	0	0	0	0	0	0	0
Example	Segment 4 Rotate: CCW	Segment 4 Color 2 Intensity: High			Segment 4 Color 2: Green			

Octet 20								
Bit offset	87	86	85	84	83	82	81	80
Subindex	29			28		27		
Value	0	0	0	0	0	0	0	1
Example	Segment 4 Pulse Pattern: Normal			Segment 4 Speed: Medium		Segment 4 Animation Type: Steady		

Octet 21								
Bit offset	79	78	77	76	75	74	73	72
Subindex	-	26			25			
Value		0	0	0	0	1	0	0
Example		Segment 4 Color 1 Intensity: High			Segment 4 Color 1: Yellow			

Octet 22								
Bit offset	71	70	69	68	67	66	65	64
Subindex	24	23			22			
Value	0	0	0	0	0	0	0	0
Example	Segment 3 Rotate: CCW	Segment 3 Color 2 Intensity: High			Segment 3 Color 2: Green			

Octet 23								
Bit offset	63	62	61	60	59	58	57	56
Subindex	21			20		19		
Value	0	0	0	1	0	1	1	1
Example	Segment 3 Pulse Pattern: Normal			Segment 3 Speed: Slow		Segment 3 Animation Type: Intensity sweep		

Octet 24								
Bit offset	55	54	53	52	51	50	49	48
Subindex	-	18			17			
Value		0	0	1	0	0	0	0

Octet 24								
Example		Segment 3 Color 1 Intensity: Low			Segment 3 Color 1: Green			

Octet 25								
Bit offset	47	46	45	44	43	42	41	40
Subindex	16	15			14			
Value	0	0	0	0	0	0	0	0
Example	Segment 2 Rotate: CCW	Segment 2 Color 2 Intensity: High			Segment 2 Color 2: Green			

Octet 26								
Bit offset	39	38	37	36	35	34	33	32
Subindex	13			12		11		
Value	0	0	0	0	0	0	0	0
Example	Segment 2 Pulse Pattern: Normal			Segment 2 Speed: Medium		Segment 2 Animation Type: Steady		

Octet 27								
Bit offset	31	30	29	28	27	26	25	24
Subindex	-	10			9			
Value		0	0	0	1	0	0	1
Example		Segment 2 Color 1 Intensity: High			Segment 2 Color 1: Blue			

Octet 28								
Bit offset	23	22	21	20	19	18	17	16
Subindex	8	7			6			
Value	1	0	0	0	0	0	0	0
Example	Segment 1 Rotate: CW	Segment 1 Color 2 Intensity: High			Segment 1 Color 2: Green			

Octet 29								
Bit offset	15	14	13	12	11	10	9	8
Subindex	5			4		3		
Value	0	0	1	0	0	0	1	0
Example	Segment 1 Pulse Pattern: Strobe			Segment 1 Speed: Medium		Segment 1 Animation Type: Flash		

Octet 30								
Bit offset	7	6	5	4	3	2	1	0
Subindex	-	2			1			
Value		0	0	0	1	1	0	1
Example		Segment 1 Color 1 Intensity: High			Segment 1 Color 1: White			

Run Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Animation	4	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep, 8 = Scroll, 9 = Bounce, 10 = Color Spectrum, 11 = Demo
2	Color 1	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 = Custom 1, 15 = Custom 2
3	Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
4	Speed	2	0 = Medium, 1 = Fast, 2 = Slow
5	Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
6	Color 2	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 = Custom 1, 15 = Custom 2
7	Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
8	Segment Shift	1	0 = No Shift, 1 = Shift Enabled
9	Rotational Direction	1	0 = Counter Clockwise, 1 = Clockwise
10	Audible State	2	0 = Off, 1 = On, 2 = Pulsed, 3 = SOS Pulse

Run Mode Example Process Data Out

Octet 0								
Bit offset	247	246	245	244	243	242	241	240
Subindex	-	-	-	-	-	-	10	
Value							0	1
Example							Audible State: On	

Octet 1								
Bit offset	239	238	237	236	235	234	233	232
Subindex	-	-	-	-	-	-	-	9
Value								0
Example								Rotation: CCW

Octet 2								
Bit offset	231	230	229	228	227	226	225	224
Subindex	-	-	-	-	-	-	-	8
Value								1
Example								Shift: Enabled

Octet 3								
Bit offset	223	222	221	220	219	218	217	216
Subindex	-	-	-	-	-	7		
Value						0	0	0
Example						Color 2 Intensity: High		

Octet 4								
Bit offset	215	214	213	212	211	210	209	208
Subindex	-	-	-	-	6			
Value					1	0	0	1
Example					Color 2: Blue			

Octet 5								
Bit offset	207	206	205	204	203	202	201	200
Subindex	-	-	-	-	-	5		
Value						0	0	0
Example						Pulse Pattern: Normal		

Octet 6								
Bit offset	199	198	197	196	195	194	193	192
Subindex	-	-	-	-	-	-	4	
Value							0	1
Example							Speed: Fast	

Octet 7								
Bit offset	191	190	189	188	187	186	185	184
Subindex	-	-	-	-	-	3		
Value						0	0	0
Example						Color 2 Intensity: High		

Octet 8								
Bit offset	183	182	181	180	179	178	177	176
Subindex	-	-	-	-	2			
Value					0	0	0	1
Example					Color 2: Red			

Octet 9								
Bit offset	175	174	173	172	171	170	169	168
Subindex	-	-	-	-	1			
Value					0	1	0	1
Example					Animation: 50/50 Rotate			

Octet 10-30								
Bit offset	167	166					1	0
Subindex	-	-	-	-	-	-	-	-

Level Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Audible State	2	0 = Off, 1 = On, 2 = Pulsed, 3 = SOS Pulse
2	Level Mode Value	16	0 - 65,535

Level Mode Example Process Data Out

Octet 0								
Bit offset	247	246	245	244	243	242	241	240
Subindex	2							
Value	0	0	0	0	0	0	0	0
Example	Level Mode Value: 92							

Octet 1								
Bit offset	239	238	237	236	235	234	233	232
Subindex	2							
Value	0	1	0	1	1	1	0	0
Example	Level Mode Value: 92							

Octet 2								
Bit offset	231	230	229	228	227	226	225	224
Subindex	-	-	-	-	-	-	-	-

Octet 3								
Bit offset	223	222	221	220	219	218	217	216
Subindex	-	-	-	-	-	-	1	
Value							1	0
Example							Audible State: Pulsed	

Octet 4-30								
Bit offset	215	214					1	0
Subindex	-	-	-	-	-	-	-	-

Parameters Set Using IO-Link

These parameters can be read from and/or written to an IO-Link model of the TL50 Pro.

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**						
	0	Parameter (write) Access Lock	Boolean	0 = off, 1 = on	0	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	1	Data Storage Lock	Boolean	0 = off, 1 = on	0	rw	y	
	2	Local Parameterization Lock	Boolean	0 = off, 1 = on		rw	y	
	3	Local User Interface Lock	Boolean	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		TL50		ro		
19		Product ID string		TL50*K*Q		ro		
20		Product Text string		TL50 Pro 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-bit uinteger	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		
38-63								
64		Operating Mode Selection	2-bit uinteger	0 = Basic Segment Mode, 1 = Advanced Segment Mode, 2 = Run Mode, 3 = Level Mode	1	rw	y	
65		**Segment 1 Basic Mode Parameters**						
	1	Basic Color	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	2	Basic Speed	2-bit uinteger	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom	0	rw	y	
	3	Animation Type	3-bit uinteger	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = 50/50, 5 = 50/50 Rotate, 6 = Chase, 7 = Intensity Sweep	0	rw	y	
	4	Animation Color 1	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	5	Animation Color 1 Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	6	Animation Speed	2-bit uinteger	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom	0	rw	y	
	7	Animation Pattern	3-bit uinteger	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	8	Animation Color 2	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	9	Animation Color 2 Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	10	Animation Rotational Direction	Boolean	0 = Counter Clockwise, 1 = Clockwise	0	rw	y	
66		Segment 2 Basic Mode Parameters (same structure as Index 65)						
67		Segment 3 Basic Mode Parameters (same structure as Index 65)						
68		Segment 4 Basic Mode Parameters (same structure as Index 65)						
69		Segment 5 Basic Mode Parameters (same structure as Index 65)						
70		Segment 6 Basic Mode Parameters (same structure as Index 65)						
71		Segment 7 Basic Mode Parameters (same structure as Index 65)						
72		Segment 8 Basic Mode Parameters (same structure as Index 65)						
73		Segment 9 Basic Mode Parameters (same structure as Index 65)						
74		Segment 10 Basic Mode Parameters (same structure as Index 65)						
75		**Additional Settings** (subindex access supported)						
	1	Custom Intensity (0 - 100%)	8-bit uinteger	0-100	100	rw	y	
	2	Custom Flash Rate (0.5 - 20)	8-bit uinteger	0.5-20	15	rw	y	
	3	Numbers of Segment for Scroll and Bounce	8-bit uinteger	0-10	2	rw	y	
	4	Restrict To Gamut	Boolean	0=Off, 1=On	0	rw	y	
	5	Reserved	7-bit uinteger		0			
76		**Custom 1** (subindex access supported)						

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	1	Red	8-bit uinteger	0-255	255	rw	y	
	2	Green	8-bit uinteger	0-255	255	rw	y	
	3	Blue	8-bit uinteger	0-255	255	rw	y	
77		**Custom 2** (subindex access supported)						
	1	Red	8-bit uinteger	0-255	255	rw	y	
	2	Green	8-bit uinteger	0-255	255	rw	y	
	3	Blue	8-bit uinteger	0-255	255	rw	y	
78		**Level Mode Configuration** (subindex access supported)						
	1	Full Scale Value	16-bit uinteger		100	rw	y	
	2	Base Color	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	3	Base Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Base State	Boolean	0 = Steady, 1 = Flashing	0	rw	y	
	5	Threshold Type	2-bit uinteger	0 = None, 1 = Low, 2 = High, 3 = High and Low	0	rw	y	
	6	Low Threshold Value	16-bit uinteger		20	rw	y	
	7	Low Threshold Color	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	8	Low Threshold Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	9	Low Threshold State	Boolean	0 = Steady, 1 = Flashing	0	rw	y	
	10	High Threshold Value	16-bit uinteger		80	rw	y	
	11	High Threshold Color	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	12	High Threshold Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	13	High Threshold State	8-bit uinteger	0 = Steady, 1 = Flashing	0	rw	y	
	14	Flash Rate	2-bit uinteger	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom	0	rw	y	
	15	Dominance	Boolean	0 = Non-Dominant, 1 = Dominant	0	rw	y	
	16	Subsegment Style	2-bit uinteger	0 = Steady, 1 = Flashing, 2 = Analog	2	rw	y	
	17	Background Color	4-bit uinteger	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 = Custom 1, 15 = Custom 2	0	rw	y	
	18	Background Intensity	3-bit uinteger	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	3	rw	y	
	19	Orientation	Boolean	0 = Standard Orientation, 1 = Upside Down	0	rw	y	

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
20753 (0x5111)	Error	Primary supply voltage under-run/Check tolerance of power supply

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
	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

Error Types			
Code	**Additional Code**	**Name**	**Description**
	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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