TLF100 Pro IO-Link Data Reference Guide

IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-TL100-20211029-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	N/A
Process Data Out length	22-bytes
Bit Rate	38400 bps
Minimum cycle time	11.2 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)

Segment Mode

Segment Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Segment 1	16	0 = Off, 1 = On
2	Segment 2		
3	Segment 3		
4	Segment 4		
5	Audible		

Segment Mode Example Process Data Out								
Octet	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Bit offset	175 - 168	167 - 160	159 - 152	151 - 144	143 - 136	135 - 128	127 - 120	119 - 112
Subindex	-	-	-	-	-	-	-	-
Octet	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Bit offset	111 - 104	103 - 96	95 - 88	87 - 80	79 - 72	71 - 64	63 - 56	55 - 48
Subindex	-	-	-	-	5	5	4	4
Value	-	-	-	-	0	1	0	0
Example	-	-	-	-	Audible: On		Segment 4: Off	
Element bit	-	-	-	-	15 - 8	7 - 0	15 - 8	7 - 0
Octet	**16**	**17**	**18**	**19**	**20**	**21**	**-**	**-**
Bit offset	47 - 40	39 - 32	31 - 24	23 - 16	15 - 8	7 - 0		
Subindex	3	3	2	2	1	1	-	-
Value	0	1	0	0	0	1	-	-
Example	Segment 3: On		Segment 2: Off		Segment 1: On		-	-
Element bit	15 - 8	7 - 0	15 - 8	7 - 0	15 - 8	7 - 0	-	-

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ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

Run Mode

Run Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Scroll, 5 = Bounce, 6 = Intensity Sweep, 7 = Two Color Sweep, 8 = Spectrum
2	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2
3	Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
4	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2
5	Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
6	Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate
7	Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
8	*Reserved*	2	
9	Direction	1	0 = Up, 1 = Down
10	Percent Width of Color 1	8	1–100 = Percent Width of Color 1
11	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom
12	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High

Run Mode Example Process Data Out								
Octet 0								
Bit offset	175	174	173	172	171	170	169	168
Subindex	-	-	-	-	-	-	-	-
Octet 1								
Bit offset	167	166	165	164	163	162	161	160
Subindex	-	-	-	-	-	-	-	-
Octet 2								
Bit offset	159	158	157	156	155	154	153	152
Subindex	-	-	-	-	-	-	-	-
Octet 3								
Bit offset	151	150	149	148	147	146	145	144
Subindex	-	-	-	-	-	-	-	-
Octet 4								
Bit offset	143	142	141	140	139	138	137	136
Subindex	-	-	-	-	-	-	-	-
Octet 5								
Bit offset	135	134	133	132	131	130	129	128
Subindex	-	-	-	-	-	-	-	-
Octet 6								
Bit offset	127	126	125	124	123	122	121	120
Subindex	-	-	-	-	-	-	-	-
Octet 7								
Bit offset	119	118	117	116	115	114	113	112
Subindex	-	-	-	-	-	-	-	-

Octet 8								
Bit offset	111	110	109	108	107	106	105	104
Subindex	-	-	-	-	-	-	-	-
Octet 9								
Bit offset	103	102	101	100	99	98	97	96
Subindex	-	-	-	-	-	-	-	-
Octet 10								
Bit offset	95	94	93	92	91	90	89	88
Subindex	-	-	-	-	-	-	-	-
Octet 11								
Bit offset	87	86	85	84	83	82	81	80
Subindex	-	-	-	-	-	-	-	-
Octet 12								
Bit offset	79	78	77	76	75	74	73	72
Subindex	-	-	-	-	-	-	-	-
Octet 13								
Bit offset	71	70	69	68	67	66	65	64
Subindex	-	-	-	-	-	-	-	-
Octet 14								
Bit offset	63	62	61	60	59	58	57	56
Subindex	-	-	-	-	-	-	-	-
Octet 15								
Bit offset	55	54	53	52	51	50	49	48
Subindex	12							
Value	0	0	0	0	0	0	1	1
Example	Audible Volume: High							
Octet 16								
Bit offset	47	46	45	44	43	42	41	40
Subindex	11							
Value	0	0	0	0	0	0	0	1
Example	Audible Type: Wobble							
Octet 17								
Bit offset	39	38	37	36	35	34	33	32
Subindex	10							
Value	0	0	1	1	0	0	1	0
Example	Percent Width of Color 1: 50							
Octet 18								
Bit offset	31	30	29	28	27	26	25	24
Subindex	9	8		7			6	
Value	0	-		0	0	0	0	1
Example	Direction: Up			Pulse Pattern: Normal			Speed: Fast	
Octet 19								
Bit offset	23	22	21	20	19	18	17	16
Subindex	5			4				
Value	0	0	0	0	0	0	0	0
Example	Color 1 Intensity: High			Color 2: Green				

Octet 20								
Bit offset	15	14	13	12	11	10	9	8
Subindex	3			2				
Value	0	0	0	0	0	0	0	1
Example	Color 1 Intensity: High			Color 1: Red				
Octet 21								
Bit offset	7	6	5	4	3	2	1	0
Subindex	1							
Value	0	0	0	0	0	1	0	0
Example	Animation: Scroll							

Level Mode

Level Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Level Mode Value	16	0-65535

Level Mode Example Process Data Out								
Octet	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Bit offset	175 - 168	167 - 160	159 - 152	151 - 144	143 - 136	135 - 128	127 - 120	119 - 112
Subindex	-	-	-	-	-	-	-	-
Octet	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Bit offset	111 - 104	103 - 96	95 - 88	87 - 80	79 - 72	71 - 64	63 - 56	55 - 48
Subindex	-	-	-	-	-	-	-	-
Octet	**16**	**17**	**18**	**19**	**20**	**21**	**-**	**-**
Bit offset	47 - 40	39 - 32	31 - 24	23 - 16	15 - 8	7 - 0	-	-
Subindex	-	-	-	-	1	1	-	-
Value	-	-	-	-	1001	0110	-	-
Example	-	-	-	-	Level Mode Value: 150		-	-
Element Bit	-	-	-	-	-	-	-	-

Advanced Mode

Advanced Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
1	Segment 1 Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Ends Steady, 6 = Ends Flash, 7 = Scroll, 8 = Center Scroll, 9 = Bounce, 10 = Center Bounce, 11 = Intensity Sweep, 12 = Two Color Sweep, 13 = Spectrum, 14 = Level Steady, 15 = Level Flash
2	Segment 1 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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2
3	Segment 1 Color 1 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
4	Segment 1 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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2
5	Segment 1 Color 2 Intensity	3	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom
6	Segment 1 Speed	2	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate
7	Segment 1 Pulse Pattern	3	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random
8	Segment 1 Scroll/ Bounce Style	2	0 = Solid, 1 = Tail, 2 = Ripple

Advanced Mode			
Subindex	**Name**	**Number of Bits**	**Data Values**
9	Segment 1 Direction	1	False = Up, True = Down
10	Segment 1 Percent Width of Color 1	8	1–100 = Percent Width of Color 1
11...40	Segments 2 through 4		
41	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom
42	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High

Advanced Mode Example Process Data Out								
Octet 0								
Bit offset	175	174	173	172	171	170	169	168
Subindex	42							
Value	0	0	0	0	0	0	1	1
Example	Audible Volume: High							
Octet 1								
Bit offset	167	166	165	164	163	162	161	160
Subindex	-	-	-	-	-	-	-	-
Value	0	0	0	1	0	0	0	0
Example	Audible Type: Jingle							
Octet 2 through 16: Segments 2 through 4								
Bit offset	Segment 4: 159 through 120 Segment 3: 119 through 80 Segment 2: 79 through 40							
Subindex	See below							
Value	See below							
Example	See below							
Octet 17								
Bit offset	39	38	37	36	35	34	33	32
Subindex	10							
Value	0	0	1	1	0	0	1	0
Example	Segment 1 Percent Width of Color 1: 50							
Octet 18								
Bit offset	31	30	29	28	27	26	25	24
Subindex	9	8		7			6	
Value	0	0	0	0	0	0	0	1
Example	Segment 1 Direction: Up	Segment 1 Scroll/Bounce Style: Solid		Segment 1 Pulse Pattern: Normal			Segment 1 Speed: Fast	
Octet 19								
Bit offset	23	22	21	20	19	18	17	16
Subindex	5			4				
Value	0	0	0	0	0	0	0	1
Example	Segment 1 Color 2 Intensity: High			Segment 1 Color 2: Red				
Octet 20								
Bit offset	15	14	13	12	11	10	9	8
Subindex	3			2				
Value	0	0	0	0	0	0	0	0

Octet 20								
Example	Segment 1 Color 1 Intensity: High			Segment 1 Color 1: Green				
Octet 21								
Bit offset	7	6	5	4	3	2	1	0
Subindex	1							
Value	0	0	0	0	0	0	0	1
Example	Segment 1 Animation: Steady							

Parameters Set Using IO-Link

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
0	1-16	Direct Parameter Page 1 (incl. Vendor ID & Device ID)	128			rw		
1	1-16	Direct Parameters Page 2	128			rw		
2		Standard Command	8	130 = Restore Factory Settings		wo		
3-11								
12		**Device Access Locks**	16					
	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	512	Banner Engineering Corporation		ro		
17		Vendor Text string	512	More Sensors. More Solutions.		ro		
18		Product Name string	512	TLF100 Pro with IO-Link		ro		
19		Product ID string	512	TLF100P*K*QP		ro		
20		Product Text string	512	TLF100 Pro with IO-Link		ro		
21		Serial Number	128			ro		
22								
23		Firmware Version	512			ro		
24		App Specific Tag (user defined)	256			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	6-Jan	Detailed Device Status	Array[6] of 3octet			ro		
38-63								
64		Operating Mode Selection	8	0 = Segment Mode 1 = Run Mode 2 = Level Mode 3 = Advanced Segment Mode 4 = Demo Mode	3	rw	y	
65		**Segment Configuration**						
	1	Segment Mode	8	0 = Manual Segment Configuration, 1 = 1 Segment, 2 = 2 Segments, 3 = 3 Segments, 4 = 4 Segments	4	rw	y	
	2	Background Color	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	13	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	3	Background Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	3	rw	y	
	4	Animation Synchronization	8	0 = Animation Sync Disabled, 1 = Animation Sync Enabled	1	rw	y	
66		**Segment 1 Config**						
	1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Ends Steady, 6 = Ends Flash, 7 = Scroll, 8 = Center Scroll, 9 = Bounce, 10 = Center Bounce, 11 = Intensity Sweep, 12 = Two Color Sweep, 13 = Spectrum, 14 = Level Steady, 15 = Level Flash	1	rw	y	
	2	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	3	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	5	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	6	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	9	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	10	Direction	8	0 = Up, 1 = Down	0	rw	y	
67		**Segment 2 Config**						
	1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Ends Steady, 6 = Ends Flash, 7 = Scroll, 8 = Center Scroll, 9 = Bounce, 10 = Center Bounce, 11 = Intensity Sweep, 12 = Two Color Sweep, 13 = Spectrum, 14 = Level Steady, 15 = Level Flash	1	rw	y	
	2	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	4	rw	y	
	3	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	5	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	6	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	9	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	10	Direction	8	0 = Up, 1 = Down	0	rw	y	
68		**Segment 3 Config**						

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Ends Steady, 6 = Ends Flash, 7 = Scroll, 8 = Center Scroll, 9 = Bounce, 10 = Center Bounce, 11 = Intensity Sweep, 12 = Two Color Sweep, 13 = Spectrum, 14 = Level Steady, 15 = Level Flash	1	rw	y	
	2	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	0	rw	y	
	3	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	5	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	6	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	9	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	10	Direction	8	0 = Up, 1 = Down	0	rw	y	
69		**Segment 4 Config**						
	1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Ends Steady, 6 = Ends Flash, 7 = Scroll, 8 = Center Scroll, 9 = Bounce, 10 = Center Bounce, 11 = Intensity Sweep, 12 = Two Color Sweep, 13 = Spectrum, 14 = Level Steady, 15 = Level Flash	1	rw	y	
	2	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	9	rw	y	
	3	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	5	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	6	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	9	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	10	Direction	8	0 = Up, 1 = Down	0	rw	y	
76		**General Level Configuration**						
	1	Background Color	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	13	rw	y	
	2	Background Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	1	rw	y	
	3	Dominance	8	0 = Non-Dominant, 1 = Dominant	0	rw	y	
	4	Sub-Segment Style	8	0 = Solid, 1 = Analog	1	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	5	Filtering	8	0 = None, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
	6	Hysteresis	8	0 = None, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
	7	Full Scale Value	16	0–65535	100	rw	y	
77		**Level Base Configuration**						
	1	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Scroll, 6 = Center Scroll, 7 = Bounce, 8 = Center Bounce, 9 = Intensity Sweep, 10 = Two Color Sweep, 11 = Spectrum, 12 = Single End Steady, 13 = Single End Flash	1	rw	y	
	2	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	0	rw	y	
	3	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	4	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	5	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	6	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	9	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	10	Direction	8	0 = Up, 1 = Down	0	rw	y	
	11	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	12	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
78		**Level Threshold 1 Configuration**						
	1	Threshold Enable	8	0 = Threshold Disabled, 1 = Threshold Enabled	1	rw	y	
	2	Threshold Value (Percent)	8	0–100 = Threshold (Percent)	33	rw	y	
	3	Threshold Comparison	8	0 = Less Than or Equal To, 1 = Greater Than or Equal To	1	rw	y	
	4	Threshold Override	8	0 = Override Not Enabled, 1 = Override Enabled	0	rw	y	
	5	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Scroll, 6 = Center Scroll, 7 = Bounce, 8 = Center Bounce, 9 = Intensity Sweep, 10 = Two Color Sweep, 11 = Spectrum, 12 = Single End Steady, 13 = Single End Flash	1	rw	y	
	6	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	4	rw	y	
	7	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	9	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	10	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	11	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	12	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	13	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	14	Direction	8	0 = Up, 1 = Down	0	rw	y	
	15	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	16	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
79		**Level Threshold 2 Configuration**						
	1	Threshold Enable	8	0 = Threshold Disabled, 1 = Threshold Enabled	1	rw	y	
	2	Threshold Value (Percent)	8	0–100 = Threshold (Percent)	66	rw	y	
	3	Threshold Comparison	8	0 = Less Than or Equal To, 1 = Greater Than or Equal To	1	rw	y	
	4	Threshold Override	8	0 = Override Not Enabled, 1 = Override Enabled	0	rw	y	
	5	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Scroll, 6 = Center Scroll, 7 = Bounce, 8 = Center Bounce, 9 = Intensity Sweep, 10 = Two Color Sweep, 11 = Spectrum, 12 = Single End Steady, 13 = Single End Flash	1	rw	y	
	6	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	7	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	9	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	10	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	11	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	12	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	13	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	14	Direction	8	0 = Up, 1 = Down	0	rw	y	
	15	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	16	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
80		**Level Threshold 3 Configuration**						
	1	Threshold Enable	8	0 = Threshold Disabled, 1 = Threshold Enabled	0	rw	y	
	2	Threshold Value (Percent)	8	0–100 = Threshold (Percent)	77	rw	y	
	3	Threshold Comparison	8	0 = Less Than or Equal To, 1 = Greater Than or Equal To	1	rw	y	
	4	Threshold Override	8	0 = Override Not Enabled, 1 = Override Enabled	0	rw	y	
	5	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Scroll, 6 = Center Scroll, 7 = Bounce, 8 = Center Bounce, 9 = Intensity Sweep, 10 = Two Color Sweep, 11 = Spectrum, 12 = Single End Steady, 13 = Single End Flash	1	rw	y	

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
	6	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	13	rw	y	
	7	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	9	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	10	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	11	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	12	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	13	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	14	Direction	8	0 = Up, 1 = Down	0	rw	y	
	15	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	16	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
81		**Level Threshold 4 Configuration**						
	1	Threshold Enable	8	0 = Threshold Disabled, 1 = Threshold Enabled	0	rw	y	
	2	Threshold Value (Percent)	8	0–100 = Threshold (Percent)	88	rw	y	
	3	Threshold Comparison	8	0 = Less Than or Equal To, 1 = Greater Than or Equal To	1	rw	y	
	4	Threshold Override	8	0 = Override Not Enabled, 1 = Override Enabled	0	rw	y	
	5	Animation	8	0 = Off, 1 = Steady, 2 = Flash, 3 = Two Color Flash, 4 = Two Color Shift, 5 = Scroll, 6 = Center Scroll, 7 = Bounce, 8 = Center Bounce, 9 = Intensity Sweep, 10 = Two Color Sweep, 11 = Spectrum, 12 = Single End Steady, 13 = Single End Flash	1	rw	y	
	6	Color 1	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	9	rw	y	
	7	Color 1 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	8	Speed	8	0 = Medium, 1 = Fast, 2 = Slow, 3 = Custom Flash Rate	0	rw	y	
	9	Pulse Pattern	8	0 = Normal, 1 = Strobe, 2 = Three Pulse, 3 = SOS, 4 = Random	0	rw	y	
	10	Color 2	8	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 = Daylight White (5000K), 14 = Custom 1, 15 = Custom 2	1	rw	y	
	11	Color 2 Intensity	8	0 = High, 1 = Low, 2 = Medium, 3 = Off, 4 = Custom	0	rw	y	
	12	Scroll/Bounce Style	8	0 = Solid, 1 = Tail, 2 = Ripple	0	rw	y	
	13	Percent Width of Color 1	8	1–100 = Percent Width of Color 1	50	rw	y	
	14	Direction	8	0 = Up, 1 = Down	0	rw	y	
	15	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 12 = Sync, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	16	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	

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82		**Custom Colors**						
	1	Custom 1 Red	8	0–255 = RGB	255	rw	y	
	2	Custom 1 Green	8	0–255 = RGB	255	rw	y	
	3	Custom 1 Blue	8	0–255 = RGB	255	rw	y	
	4	Custom 2 Red	8	0–255 = RGB	255	rw	y	
	5	Custom 2 Green	8	0–255 = RGB	255	rw	y	
	6	Custom 2 Blue	8	0–255 = RGB	255	rw	y	
83		**Settings**						
	1	Orientation	8	0 = Standard, 1 = Inverted	0	rw	y	
	2	Custom Intensity	8	0–100 = Custom Intensity	100	rw	y	
	3	Custom Frequency	8	0–255 = Custom Frequency	10	rw	y	
84		**Basic Audible Settings**						
	1	Audible Type	8	0 = Pulse, 1 = Wobble, 2 = Strobe, 4 = Whoop, 5 = Staccato, 6 = Siren, 8 = Continuous 1, 9 = Continuous 2, 16 = Jingle, 17 = Melody 1, 18 = Melody 2, 19 = Melody 3, 20 = Custom	8	rw	y	
	2	Audible Volume	8	0 = Off, 1 = Low, 2 = Medium, 3 = High	0	rw	y	
85		**Custom Audible Settings**						
	1	Custom Type	4	0 = Beep, 1 = Sweep, 2 = Tone	0	rw	y	
	2	Custom Sweep Type	4	0 = Up, 1 = Down, 2 = Up-Down, 3 = Down-Up	0	rw	y	
	3	Custom Frequency 1	4	0 = Off, 1 = Low, 2 = Standard, 3 = High	0	rw	y	
	4	Custom Frequency 2	4	0 = Off, 1 = Low, 2 = Standard, 3 = High	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

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
	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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