IO-Link® Data Reference Guide -- Pro Indicators

IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-ProIndicators-20210104-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.

This IO-Link Data Reference Guide refers to the following product families:

- K50 Pro Indicator with IO-Link (datasheet p/n 197816)
- K50 Pro Beacon with IO-Link (datasheet p/n 219895)
- K90 Pro Indicator with IO-Link (datasheet p/n 220947)

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	32-bit
Bit Rate	38400 bps
Minimum cycle time	4 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)

Subindex	Name	Number of Bits	Data Values
1	Color 1	5	0=Green, 1=Red, 2=Orange, 3=Yellow, 4=Lime Green, 5=Spring Green, 6=Cyan, 7=Sky Blue, 8=Blue, 9=Violet, 10=Magenta, 11=Rose, 12= White, 13=Custom1, 14=Custom2, 15=Custom3, 16=Custom4, 17=Custom5
2	Color Flash Rate (Hz)	3	0=1.5, 1=0.5, 2=3.0, 3=6.0, 4=9.0, 5=12.0, 6=Custom
3	Color 2	5	0=Green, 1=Red, 2=Orange, 3=Yellow, 4=Lime Green, 5=Spring Green, 6=Cyan, 7=Sky Blue, 8=Blue, 9=Violet, 10=Magenta, 11=Rose, 12= White, 13=Custom1, 14=Custom2, 15=Custom3, 16=Custom4, 17=Custom5
4	Audible Mode (K50L2 Only)	2	0=Off, 1=On, 2=Pulse
5	Rotation Direction	1	0=CCW, 1=CW
6	Animation Type	4	0=Off, 1=Steady, 2=Flash, 3=Two Flash, 4=Strobe, 5=Half/Half, 6=Half/Half Rotate, 7=Chase, 8=Demo Mode
7	Color 1 Intensity	4	0=High, 1=Low, 2=Medium, 3=Custom, 4=Off
8	Color 2 Intensity	4	0=High, 1=Low, 2=Medium, 3=Custom, 4=Off
9	Reserved	4	

Example Process Data Out

Octet 0								
Subindex	9	9	9	9	8	8	8	8
Bit offset	31	30	29	28	27	26	25	24
Value	0	0	0	0	0	0	0	1
Example	Reserved				Color 2 Intensity: High			

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Octet 1								
Subindex	7	7	7	7	6	6	6	6
Bit offset	23	22	21	20	19	18	17	16
Value	0	0	0	0	0	0	1	0
Example	Color 1 Intensity: Low				Animation Type: Flash			

Octet 2								
Subindex	5	4	4	3	3	3	3	3
Bit offset	15	14	13	12	11	10	9	8
Value	1	0	0	0	1	1	1	1
Example	Rotation: CW	Audible Mode: Off		Color 2: Custom3				

Octet 3								
Subindex	2	2	2	1	1	1	1	1
Bit offset	7	6	5	4	3	2	1	0
Value	1	0	0	0	1	1	0	0
Example	Color Flash Rate: 9.0 Hz			Color: White				

Parameters Set Using IO-Link

These parameters can be read from and/or written to an Indicator Device with 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)				ro		
1	1-16	Direct Parameters Page 2				rw		
2		Standard Command		130 = Restore Factory Settings		wo		y
3		Data Storage Index (device-specific list of parameters to be stored)				rw		
4-11		reserved by IO-Link Specification						
12		Device Access Locks						
12	1	Parameter Write Access Lock		0 = off 1 = on	0	rw	y	
12	2	Data Storage Lock		0 = off, 1 = on	0	rw	y	
13-14		unused				ro		
15		PDOutput Descriptor				ro		
16		Vendor Name string		Banner Engineering Corp		ro		
17		Vendor Text string		More Sensors. More Solutions.		ro		
18		Product Name string		K50L2, K50PBL, or K90P		ro		
19		Product ID string		K50L2*RGBK*Q, K50PBLKQ, K50PBLKQP, K90PLKQ, or K90PLKQP		ro		
20		Product Text string		K50L2 Indicator with IO-Link, K50 Pro Beacon with IO-Link, or K90 Pro Indicator with IO-Link		ro		
21		Serial Number				ro		
22		Hardware Revision				ro		
23		Firmware Version				ro		
24		App Specific Tag (user defined)				rw	y	
25-36		reserved						
37		Detailed Device Status	Array[6] of 3-octet			ro		
38-40		reserved						
41		Process Data Output				ro		
42-58		unused/reserved						

Index	Subindex	Name	Length	Value Range	Default	Access Rights	Data Storage?	AOI
59-64		unused/reserved						
64		**Setting**						
64	1	Custom Intensity (0 - 100%)	8-bit uinteger	0-100	0	rw	y	y
64	2	Custom Flash Rate (0.5 - 20)	8-bit uinteger	0.5-20	1.5	rw	y	y
64	3	Rotation Speed / RPM (5 - 255)	8-bit uinteger	5-255	20	rw	y	y
64	4	Restrict To Gamut	1-bit integer	0=Off, 1=On	0	rw	y	y
64	5	Reserved	7-bit uinteger					
65		**Custom 1**						
65	1	Color Name	String of 8 UTF-8		NA	rw	y	y
65	2	Red	8-bit uinteger	0-255	255	rw	y	y
65	3	Green	8-bit uinteger	0-255	255	rw	y	y
65	4	Blue	8-bit uinteger	0-255	255	rw	y	y
66		**Custom 2**						
66	1	Color Name	String of 8 UTF-8		NA	rw	y	y
66	2	Red	8-bit uinteger	0-255	255	rw	y	y
66	3	Green	8-bit uinteger	0-255	255	rw	y	y
66	4	Blue	8-bit uinteger	0-255	255	rw	y	y
67		**Custom 3**						
67	1	Color Name	String of 8 UTF-8		NA	rw	y	y
67	2	Red	8-bit uinteger	0-255	255	rw	y	y
67	3	Green	8-bit uinteger	0-255	255	rw	y	y
67	4	Blue	8-bit uinteger	0-255	255	rw	y	y
68		**Custom 4**						
68	1	Color Name	String of 8 UTF-8		NA	rw	y	y
68	2	Red	8-bit uinteger	0-255	255	rw	y	y
68	3	Green	8-bit uinteger	0-255	255	rw	y	y
68	4	Blue	8-bit uinteger	0-255	255	rw	y	y
69		**Custom 5**						
69	1	Color Name	String of 8 UTF-8		NA	rw	y	y
69	2	Red	8-bit uinteger	0-255	255	rw	y	y
69	3	Green	8-bit uinteger	0-255	255	rw	y	y
69	4	Blue	8-bit uinteger	0-255	255	rw	y	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**
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

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