

# IO-Link Data Reference Guide -- K50L2 Multicolor RGB Indicator



## IO-Link Data Map

This document refers to the following IODD file: Banner\_Engineering-K50IO-20170515-IODD1.1.xml. The IODD file and support files can be found on [www.bannerengineering.com](http://www.bannerengineering.com) under the download section of the product family page.

## Communication Parameters

The following communication parameters are used.

| Parameter               | Value     | Parameter              | Value |
|-------------------------|-----------|------------------------|-------|
| IO-Link revision        | V1.1      | Port class             | A     |
| Process Data In length  | N/A       | SIO mode               | No    |
| Process Data Out length | 32-bit    | Smart sensor profile   | N/A   |
| Bit Rate                | 38400 bps | Block parameterization | Yes   |
| Minimum cycle time      | 4 ms      | 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          | 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 |    |    |    |



| 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 IO-Link model of the EZ-LIGHT K50.

| Index | Subindex | Name   | Length              | Value Range                    | Default | Access Rights | Data Storage? |
|-------|----------|--|---------------------|--------------------------------|---------|---------------|---------------|
| 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            |               |
| 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             |
| 13-15 |          | unused   |                     |                                |         | ro            |               |
| 16    |          | Vendor Name string   |                     | Banner Engineering Corp        |         | ro            |               |
| 17    |          | Vendor Text string   |                     | More Sensors. More Solutions.  |         | ro            |               |
| 18    |          | Product Name string  |                     | K50L2                          |         | ro            |               |
| 19    |          | Product ID string  |                     | K50L2*RGBK*Q                   |         | ro            |               |
| 20    |          | Product Text string  |                     | K50L2 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   |                     |                                |         |               |               |

| Index | Subindex | Name                           | Length            | Value Range | Default | Access Rights | Data Storage? |
|-------|----------|--------------------------------|-------------------|-------------|---------|---------------|---------------|
| 41    |          | Process Data Output            |                   |             |         | ro            |               |
| 42-58 |          | unused/reserved                |                   |             |         |               |               |
| 59-64 |          | unused/reserved                |                   |             |         |               |               |
| 64    |          | <b>Setting</b>                 |                   |             |         |               |               |
| 64    | 1        | Custom Intensity (0 - 100%)    | 8-bit uinteger    | 0-100       | 0       | rw            | y             |
| 64    | 2        | Custom Flash Rate (0.5 - 20)   | 8-bit uinteger    | 0.5-20      | 1.5     | rw            | y             |
| 64    | 3        | Rotation Speed / RPM (5 - 255) | 8-bit uinteger    | 5-255       | 20      | rw            | y             |
| 64    | 4        | Restrict To Gamut              | 1-bit integer     | 0=Off, 1=On | 0       | rw            | y             |
| 64    | 5        | Reserved                       | 7-bit uinteger    |             |         |               |               |
| 65    |          | Custom 1                       |                   |             |         |               |               |
| 65    | 1        | Color Name                     | String of 8 UTF-8 |             | NA      | rw            | y             |
| 65    | 2        | Red                            | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 65    | 3        | Green                          | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 65    | 4        | Blue                           | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 66    |          | Custom 2                       |                   |             |         |               |               |
| 66    | 1        | Color Name                     | String of 8 UTF-8 |             | NA      | rw            | y             |
| 66    | 2        | Red                            | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 66    | 3        | Green                          | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 66    | 4        | Blue                           | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 67    |          | Custom 3                       |                   |             |         |               |               |
| 67    | 1        | Color Name                     | String of 8 UTF-8 |             | NA      | rw            | y             |
| 67    | 2        | Red                            | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 67    | 3        | Green                          | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 67    | 4        | Blue                           | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 68    |          | Custom 4                       |                   |             |         |               |               |
| 68    | 1        | Color Name                     | String of 8 UTF-8 |             | NA      | rw            | y             |
| 68    | 2        | Red                            | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 68    | 3        | Green                          | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 68    | 4        | Blue                           | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 69    |          | Custom 5                       |                   |             |         |               |               |
| 69    | 1        | Color Name                     | String of 8 UTF-8 |             | NA      | rw            | y             |
| 69    | 2        | Red                            | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 69    | 3        | Green                          | 8-bit uinteger    | 0-255       | 255     | rw            | y             |
| 69    | 4        | Blue                           | 8-bit uinteger    | 0-255       | 255     | 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  |
| 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  |
|             | 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 |