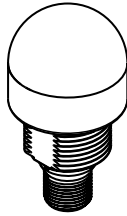


Datasheet

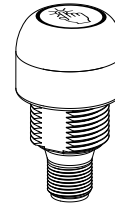
30 mm IO-Link Controlled Multicolor RGB Devices (Indicator and Touch Button)

This datasheet contains limited information on K30 Pro Devices with IO-Link. Go to www.bannerengineering.com and search **215995** to view the K30 Pro Devices IO-Link Data Reference Guide or **215996** to access the K30 Pro IODD File. Use of this document assumes familiarity with pertinent industry standards and practices.

- IO-Link gives full access to color, flashing, rotating, and dimming settings as well as advanced animations such as dynamic sequence mode and LED control
- Output settings, including on and off delays, output function, and output state are also available with IO-Link
- 18 V DC to 30 V DC operation



Indicator



Touch Button



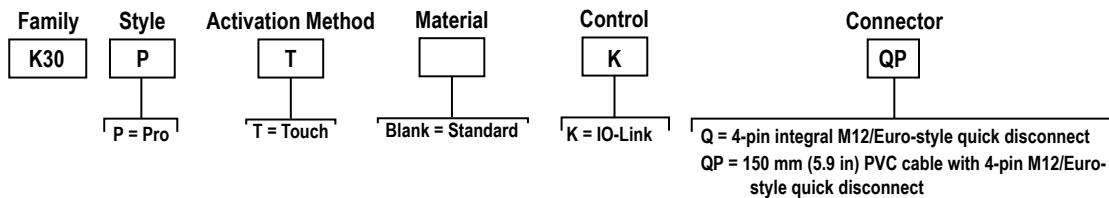
WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

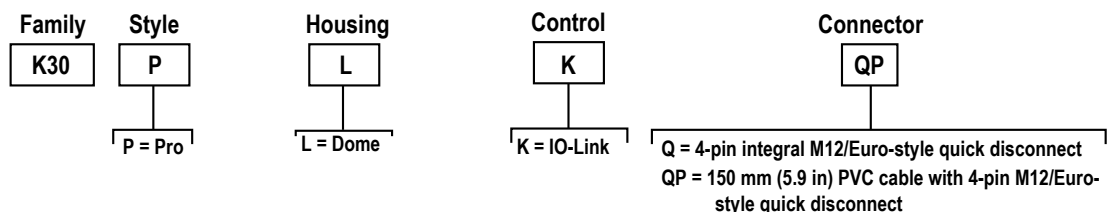
Touch Button Models

- Excellent immunity to false triggering by water spray, oils, and other foreign materials
- Rated IEC IP67 and IP69K per DIN 40050-9
- Can be actuated with bare hands or gloves; adjustable sensitivity

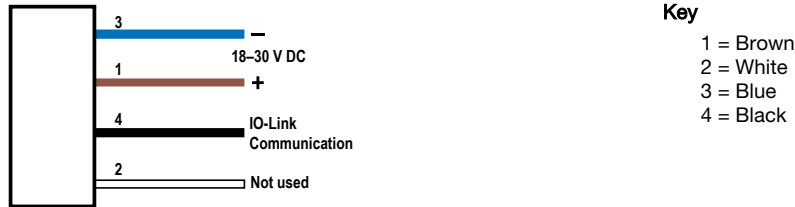


Indicator Models

- Bright, uniform indicator light
- Rated IEC IP67 and IP69K per DIN 40050-9



Wiring Diagram



IO-Link®

IO-Link® is a point-to-point communication link between a master device and a sensor and/or light. It can be used to automatically parameterize sensors or lights and to transmit process data. For the latest IO-Link protocol and specifications, please visit www.io-link.com.

For the latest IODD files, please refer to the Banner Engineering Corp website at: www.bannerengineering.com.

IO-Link Process Data In (Device to Master)

Use process data to read the device output state. When the device is in Four State Full Logic mode, use process data to read the device logic state in addition to the output state.

| Name | Description |
|---------------------|---|
| Output State | Output state follows touch button input (Touch Models Only) |
| Device State | Current state (State 1, State 2, State 3, State 4). Only available with Operation Mode set to Four State Full Logic or Multicolor |

IO-Link Process Data Out (Master to Device)

Use process data out to define device states. Use parameter data to define device modes, states, and custom colors.

Advanced Mode

Use process data to control color, intensity, flash, and other animation types. Process data is also used to control the sequence value dynamically. Use parameter data to create custom colors, intensity, speeds, and to define output and touch settings.

Four State Full Logic Mode (Touch Models Only)

Use process data to define the Job Input state and to read the touch button state and device state (State 1, State 2, State 3, State 4). See below for more information about how to achieve legacy logic types (C, D, E, and H). Use parameter data to change color, intensity, flash, speed, select animation type, and define output settings.

Multicolor Mode

Use process data to activate the defined device state. Use parameter data to define output settings, control delays, color, intensity, flash, and other animation types for State 1, State 2, State 3, and State 4.

| Name | Description |
|-----------------------|--|
| Animation Type | |
| Off | Indicator is off |
| Steady | Color 1 is solid on at defined intensity |
| Flash | Color 1 flashes at defined speed, color intensity, and pattern |
| Two Color Flash | Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern |
| 50/50 | Color 1 is displayed on 50% of the indicator and Color 2 is displayed on the other 50% of the indicator at the defined color intensities |
| 50/50 Rotate | Color 1 is displayed on 50% of the indicator and Color 2 is displayed on the other 50% of the indicator while rotating at the defined speed, color intensities, and rotational direction |
| Chase | Color 1 is displayed as a single spot against the background of Color 2 while rotating at the defined speed, color intensities, and rotational direction |
| Intensity Sweep | Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity |
| Color Sweep | Color 1 and Color 2 transition alternately at defined speed and color intensities |

| Name | Description |
|-------------------------------|---|
| Sequence | Color 1 increments against the background of Color 2 at defined Dynamic or Static Sequence Value (Advanced mode and other modes respectively) |
| Wave | Color 2 increases in intensity on the background of Color 1 from one side of the device to the other at the defined speed |
| Animation Direction | Defines the direction of rotation for the 50/50 rotate, chase, and sequence animations (CW or CCW) |
| Animation Pattern | Defines the flash pattern for flash and two color flash animations (normal, strobe, three pulse, SOS, or random) |
| Animation Speed | Defines the animation speed (slow, medium, fast, or custom) |
| Dynamic/Static Sequence Value | Defines the span of Color 1 in the Sequence animation [0-255]. 0 means no portion of the animation will be Color 1, and it increases in a circular manner to 255 which indicates the full circumference will be Color 1. In Advanced Mode, this is in process data and is called Dynamic Sequence Value. In the other modes, this is in parameter data and is called Static Sequence Value. |
| Sequence Shift | Shifts the beginning of the sequence animation to the specified LED (LED1 at 12 o'clock continuing in the direction indicated by the Animation Direction parameter) |
| Color 1 | Defines Color 1 of defined animation |
| Color 1 Intensity | Defines the intensity of Color 1 in the animation (high, medium, low, off, or custom) |
| Color 2 | Defines Color 2 of defined animation |
| Color 2 Intensity | Defines the intensity of Color 2 in the animation (high, medium, low, off, or custom) |

Four State Full Logic Mode State Descriptions

Use process data job input and the touch button input to dictate which one of these states the device should be in. Use parameter data to define the state characteristics.

State 1: Process Data job input off and touch button inactive

State 2: Process Data job input on and touch button inactive

State 3: Process Data job input off and touch button active

State 4: Process Data job input on and touch button active

| Four State Full Logic | | |
|-----------------------|--------------|----------|
| | Not Actuated | Actuated |
| No Input | State 1 | State 3 |
| Job Input | State 2 | State 4 |

| Legacy Logic Definitions (Four State Full Logic) | |
|--|--|
| C Logic | State 1 is Off. State 2 is Color 1/Job Input. State 3 is Color 2/Acknowledge. State 4 is defined the same as State 3 |
| D Logic | State 1 is Off. State 2 is Color 1/Job Input. State 3 is Off. State 4 is defined the same as State 2 |
| E Logic | State 1 is Off. State 2 is Color 1/Job Input. State 3 is Color 2/Mispick. State 4 is defined the same as State 2 |
| H Logic | State 1 is power, defined as Color 1. State 2 is defined the same as State 1. State 3 is Color 2/Sense. State 4 is defined the same as State 3 |

LED Control Mode

Use process data to define the color and intensity of each individual LED. Use parameter data to define customer colors and intensities. LED1 is oriented at the 12 o'clock position continuing clockwise through LED4 near 11 o'clock position.

| Name | Description |
|-----------------------------------|--|
| LED 1 Color...LED 4 Color | Defines the color of the designated LED. |
| LED 1 Intensity...LED 4 Intensity | Defines the intensity of the designated LED [Values: 0-10] |

Demo Mode

Cycles through color spectrum, 50/50 rotate, intensity sweep, and sequence mode. Touch button speeds cycle rate up or down (can be either Momentary or Latching). Touch button initiates state showing individually colored LEDs. When set to demo mode, the device will cycle through the defined sequence when power is applied regardless of its connection to an IO-Link master.

Touch Settings (Touch Models Only)

Use Parameter Data to define the following settings.

| Setting | Description |
|-------------------|---|
| Touch Sensitivity | Defines the sensitivity of the touch button as either Standard, High or Low. Low sensitivity resists false activation. High sensitivity can be used for improved touch response (Touch models only) |

| Setting | Description |
|----------------------|--|
| Function | Latching or Momentary Options. Momentary function toggles output on only during a touch button input. Latching function toggles output on or off for each touch button input |
| Mute Enable | Turning on mute disables the touch button input |
| On Delay (ms) | Length of time the button needs to be pressed to trigger an active state. 0-60,000 ms |

Output Settings (Touch Models Only)

Use Parameter Data to define the following settings.

| Setting | Description |
|-----------------------|--|
| Output State | Normally Open or Normally Closed. Normally Open turns the output on with a touch button input. Normally Closed turns the output off with a touch button input |
| Off Delay Type | Leading Edge or Trailing Edge. Leading Edge delays will begin once a touch button has been sensed. Trailing edge delays will begin once the touch button has been released |
| Off Delay (ms) | Length of time before the output state returns to a touch button inactive state after the button has been released. 0-60,000 ms |

Specifications

Supply Voltage

18 V DC to 30 V DC

Supply Current

Indicator Models:

33 mA maximum current at 18 V DC
28 mA typical at 24 V DC

Touch Models:

40 mA maximum current at 18 V DC
30 mA typical at 24 V DC

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Touch Dwell Time

If touch dwells for longer than 60 seconds, the output will revert to the untouched state

Operating Conditions

-40 °C to +50 °C (-40 °F to +122 °F)

Humidity: 90% at +50 °C maximum relative humidity (non-condensing)

Storage: -40 °C to +70 °C (-40 °F to +158 °F)

Environmental Rating

IEC IP67, IP69K per DIN 40050-9¹

Mounting

M22 × 1.5 threaded base, maximum torque 4.5 N-m (40 in-lbf)

Construction

Base, Dome, and Nut: Polycarbonate

Touch Response Time

Input Response: 5 ms minimum

Touch Response: 300 ms maximum (Standard Sensitivity touch response)

Vibration and Mechanical Shock

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 1.0 mm amplitude, 5 minutes sweep, 30 minutes dwell)

Meets IEC 60068-2-27 requirements (Shock: 30G 11 ms duration, half sine wave)

IO-Link Interface

Supports Smart Sensor Profile: No

Baud Rate: 38400 bps (COM2)

Process Data Out: 64 bits (8 bytes)

IODD Files: Provides all programming options, plus additional functionality

Connections

Integral 4-pin M12/Euro-style male quick disconnect or 150 mm (6 in) PVC cable with a 4-pin M12/Euro-style male quick disconnect, depending on model

Models with a quick disconnect require a mating cordset

Certifications



Default Indicator Characteristics

| Color | Dominant Wavelength (nm) or Color Temperature (CCT) | Color Coordinates ² | | Lumen Output (Typical at 25 °C) | |
|--------------|---|--------------------------------|-------|---------------------------------|------------------|
| | | x | y | Touch Button Models | Indicator Models |
| Green | 522 | 0.154 | 0.700 | 7.7 | 8.7 |
| Red | 620 | 0.689 | 0.309 | 3.1 | 3.6 |
| Yellow | 576 | 0.467 | 0.463 | 7.8 | 8.9 |
| Blue | 466 | 0.140 | 0.054 | 1.7 | 1.9 |
| White | 5700K | 0.328 | 0.337 | 9.6 | 10.7 |
| Cyan | 493 | 0.157 | 0.331 | 8.7 | 9.9 |
| Magenta | - | 0.392 | 0.186 | 4.2 | 4.6 |
| Amber | 589 | 0.556 | 0.420 | 5.8 | 6.4 |
| Rose | - | 0.525 | 0.237 | 3.5 | 3.9 |
| Lime Green | 562 | 0.383 | 0.523 | 10 | 11.5 |
| Sky Blue | 486 | 0.145 | 0.240 | 9.2 | 10.5 |
| Orange | 599 | 0.616 | 0.370 | 4.6 | 5.1 |
| Violet | - | 0.224 | 0.099 | 3.4 | 3.9 |
| Spring Green | 508 | 0.155 | 0.524 | 8 | 9 |

Required Overcurrent Protection



WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table. Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply. Supply wiring leads < 24 AWG shall not be spliced. For additional product support, go to www.bannerengineering.com.

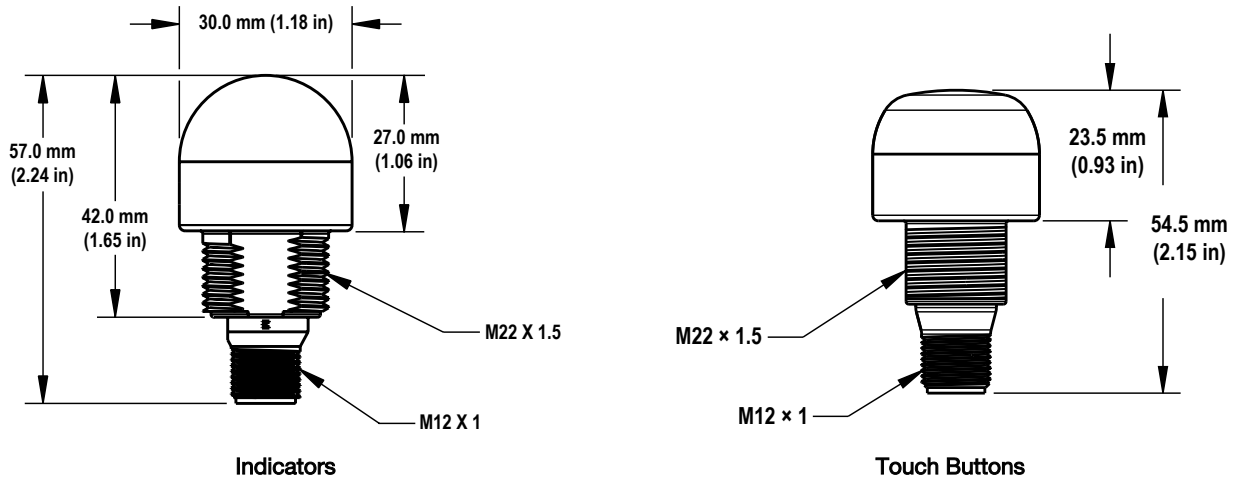
| Supply Wiring (AWG) | Required Overcurrent Protection (Amps) |
|---------------------|--|
| 20 | 5.0 |
| 22 | 3.0 |
| 24 | 2.0 |
| 26 | 1.0 |
| 28 | 0.8 |
| 30 | 0.5 |

¹ QP models must be installed to protect the cable and cable entrance from high-pressure spray to meet IP69K.

² Refer to the CIE 1931 (x,y) Chromaticity Diagram to show equivalent color with indicated color coordinates. Actual coordinates may differ ± 5%.

Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise.



Accessories

Cordsets

| 4-Pin Threaded M12/Euro-Style Cordsets—Double Ended | | | | |
|---|------------------|-----------------------------------|------------|---|
| Model | Length | Style | Dimensions | Pinout |
| MQDEC-401SS | 0.31 m (1 ft) | Male Straight/ Female Straight | | Female |
| MQDEC-403SS | 0.91 m (2.99 ft) | | | |
| MQDEC-406SS | 1.83 m (6 ft) | | | Male |
| MQDEC-412SS | 3.66 m (12 ft) | | | |
| MQDEC-420SS | 6.10 m (20 ft) | | | <p>1 = Brown 2 = White 3 = Blue 4 = Black</p> |
| MQDEC-430SS | 9.14 m (30.2 ft) | | | |
| MQDEC-450SS | 15.2 m (49.9 ft) | | | |

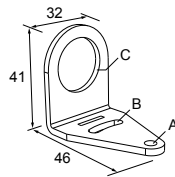
| 4-Pin Threaded M12/Euro-Style Cordsets—Double Ended, Oil Resistant | | | | |
|--|-----------------|-----------------------------------|------------|---|
| Model | Length | Style | Dimensions | Pinout |
| MQDEC-401SS-PUR | 0.3 m (0.98 ft) | Male Straight/ Female Straight | | Female |
| MQDEC-403SS-PUR | 1 m (3.28 ft) | | | |
| MQDEC-406SS-PUR | 2 m (6.56 ft) | | | Male |
| MQDEC-415SS-PUR | 5 m (16.4 ft) | | | |
| MQDEC-430SS-PUR | 10 m (32.8 ft) | | | <p>1 = Brown 2 = White 3 = Blue 4 = Black</p> |

| 4-Pin Threaded M12/Euro-Style Cordsets—Double Ended, Washdown, Stainless Steel | | | | |
|--|------------------|-----------------------------------|------------|---|
| Model | Length | Style | Dimensions | Pinout |
| MQDEC-WDSS-401SS | 0.31 m (1 ft) | Male Straight/ Female Straight | | Female |
| MQDEC-WDSS-403SS | 0.91 m (2.99 ft) | | | |
| MQDEC-WDSS-406SS | 1.83 m (6 ft) | | | Male |
| MQDEC-WDSS-412SS | 3.66 m (12 ft) | | | <p>1 = Brown 2 = White 3 = Blue 4 = Black</p> |

Brackets

SMB22A

- Right-angle bracket with curved slot for versatile orientation
- 12-ga. stainless steel
- Mounting hole for 22 mm sensor

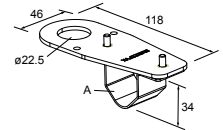


Hole center spacing: A to B = 26.0

Hole size: A = ϕ 4.6, B = 4.6 x 16.9, C = 22.2

SMB22FVK

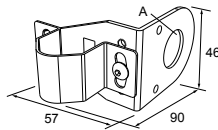
- V-clamp, flat bracket and fasteners for mounting to pipe or extensions
- Clamp accommodates 28 mm diameter tubing or 1 in. square extrusions
- 22 mm hole for mounting sensor



Hole size: A = ϕ 22.5

SMB22RAVK

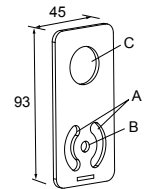
- V-clamp, right-angle bracket and fasteners for mounting to pipe or extensions
- Clamp accommodates 28 mm diameter tubing or 1 in. square extrusions
- 22 mm hole for mounting sensor



Hole size: A = ϕ 22.5

SMBAMS22P

- Flat SMBAMS series bracket with 22 mm hole for mounting sensors
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel

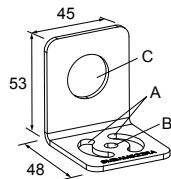


Hole center spacing: A = 26.0, A to B = 13.0

Hole size: A = 26.8 x 7.0, B = ϕ 6.5, C = ϕ 22.5

SMBAMS22RA

- Right-angle SMBAMS series bracket with 22 mm hole for mounting sensors
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel

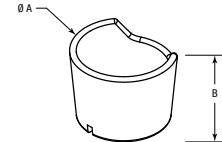


Hole center spacing: A = 26.0, A to B = 13.0

Hole size: A = 26.8 x 7.0, B = ϕ 6.5, C = ϕ 22.5

TC-K30-CL

- Touch cover



Diameter: A = 40.7

Height: B = 31

All measurements are listed in millimeters, unless noted otherwise.

Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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For patent information, see www.bannerengineering.com/patents.

FCC Part 15 and CAN ICES-3 (B)/NMB-3(B)

This device complies with part 15 of the FCC Rules and CAN ICES-3 (B)/NMB-3(B). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and CAN ICES-3 (B)/NMB-3(B). These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the manufacturer.