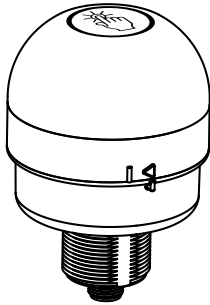


# EZ-LIGHT® K70 Wireless Touch Button



## Datasheet

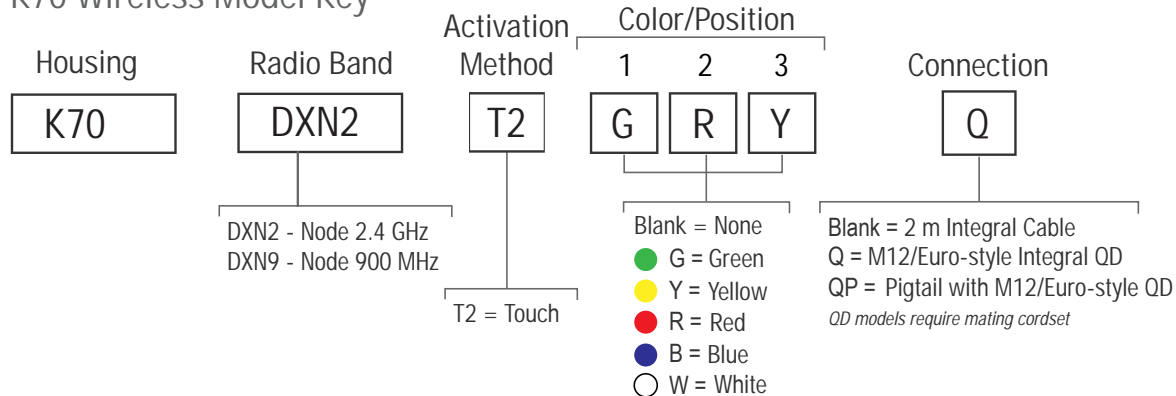
Sure Cross® Wireless K70 Touch Buttons combine the best of Banner's popular Touch Button family with its reliable, field-proven, Sure Cross wireless architecture.



- Available in 900 MHz and 2.4 GHz ISM Bands
- Up to three colors in one device
- Rugged, water-resistant IP65 housing with UV-stabilized material
- Bright, uniform indicator segments appear gray when off to eliminate false indication from ambient light
- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Ergonomically designed to eliminate hand, wrist, and arm stresses associated with repeated switch operation; require no physical force to operate

## Models

### K70 Wireless Model Key

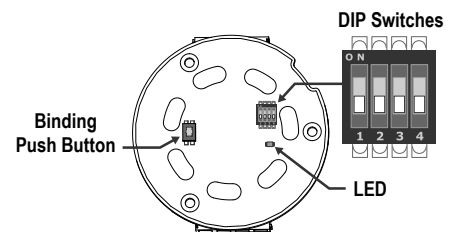


Example model number: K70DXN9T2GRYQ

## Configuration Instructions

### Set the Radio Module DIP Switches

Before applying power to the device, set the radio module's DIP switches. Default configurations are noted with (\*). After changing DIP switch positions, cycle power to the device for the changes to take effect.



DIP Switch 1: Radio Transmit Power—The 900 MHz radios can be operated at 1 watt (30 dBm) or 250 mW (24 dBm). While the Performance radios operate in 1 Watt mode, they cannot communicate with the older 150 mW radios. To communicate with the older 150 mW radios, operate this radio in 250 mW mode. For 2.4 GHz models, this DIP switch is disabled. The transmit power for 2.4 GHz is fixed at about 65 mW EIRP (18 dBm), making the 2.4 GHz Performance models automatically compatible with older 2.4 GHz models.



DIP Switch 1 Position	900 MHz Models	2.4 GHz Models
OFF *	1 Watt (30 dBm) Operation	Disabled
ON	250 mW (24 dBm) Operation	

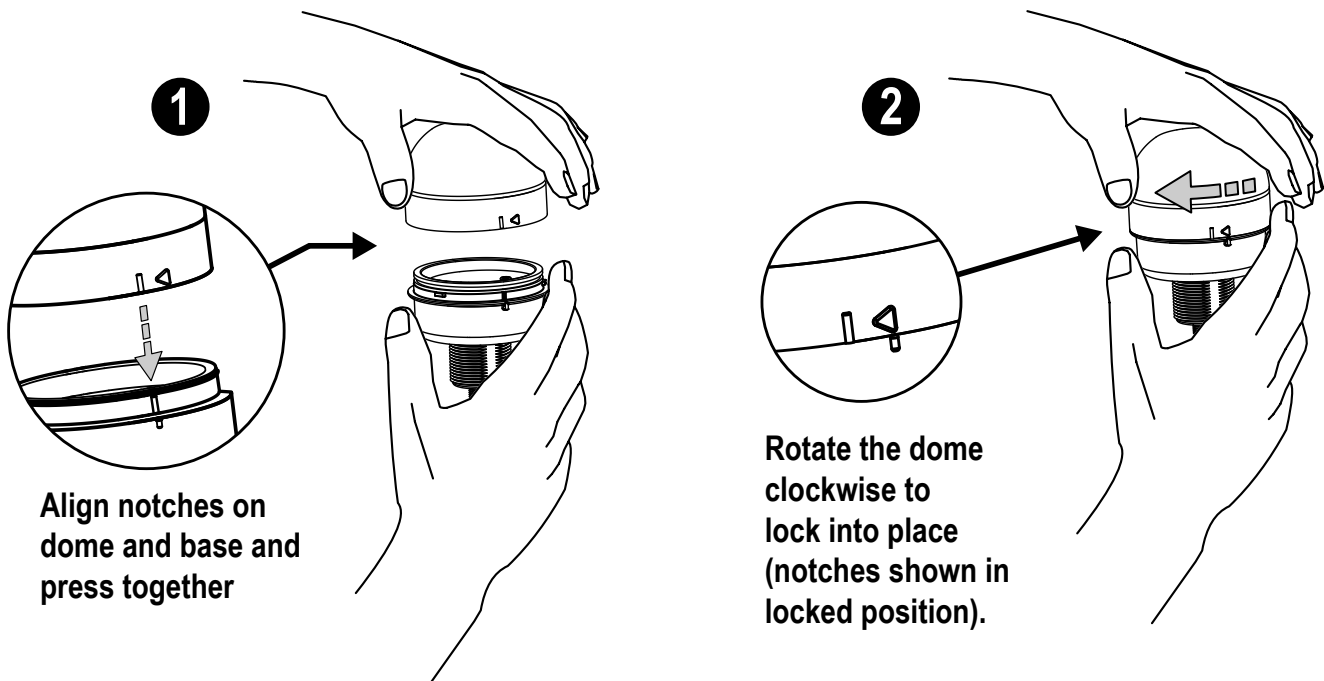
DIP Switch 2: Touch Button Behavior—Use DIP Switch 2 to set the latching or momentary behavior of the touch button.

DIP Switch 2 Position	900 MHz and 2.4 GHz Models
OFF *	Latching—Output toggles between activated and non-activated on successive touches
ON	Momentary—Remains activated while touch is present

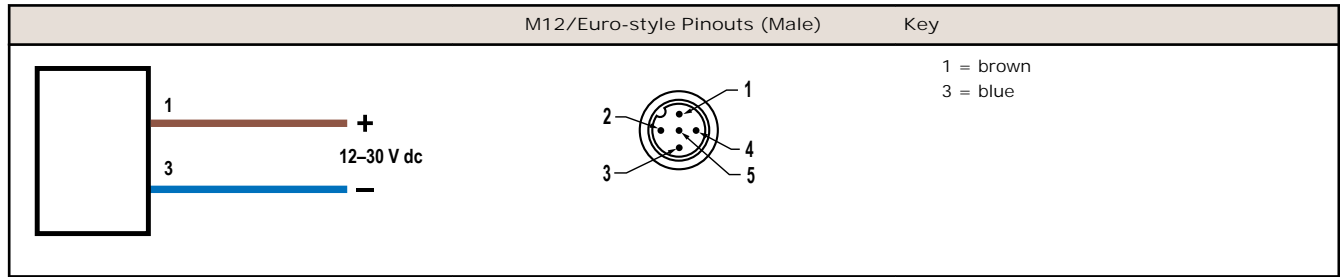
DIP Switches 3 and 4: Indicator Mapping—DIP switches 3 and 4 map the activation of the touch button to the one of the indicator light colors/positions to give visual feedback when the touch output is active.

DIP Switches		Touch Button to Indicator Mapping
3	4	
OFF *	OFF *	Mapped to Color / Position 1
OFF	ON	Mapped to Color / Position 2
ON	OFF	Mapped to Color / Position 3
ON	ON	Mapping disabled

## Assembling the K70

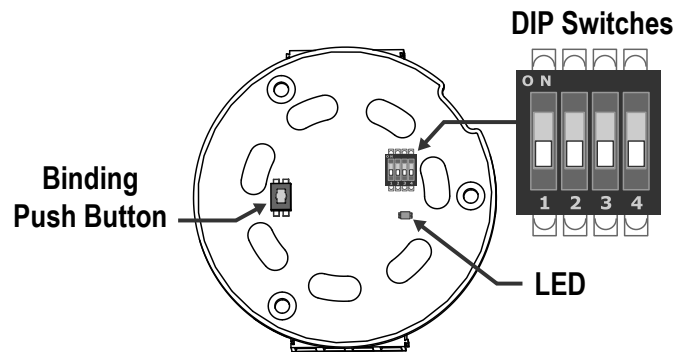


## Wiring Diagrams



## Bind the K70 to the Gateway and Assign the Node Address

Before beginning the binding procedure, apply power to all the devices.



- Enter binding mode on the Gateway.
  - For board modules, triple-click the button.
  - For housed models, triple-click button 2.

On the board modules, the green/red LED flashes. On the housed models, both LEDs flash red.
- Assign the K70 a Node address using the Gateway's rotary dials. Use the left rotary dial for the left digit and the right rotary dial for the right digit. For example, to assign your K70 to Node 01, set the left dial to 0 and the right dial to 1. Valid Node addresses are 01 through 47.
- Remove any components to access the circuit board in the base module of the K70.
- Enter binding mode on the K70 by triple-clicking the button. The bicolor LED flashes alternately while it searches for a Gateway in binding mode. After the K70 is bound, the LED is red and green for four seconds (looks amber), then it flashes four times (looks amber). The K70 automatically exits binding mode, cycles power, and enters Run mode.
- Write the Node address on the provided label. This makes it easier to identify the physical Node location within a multi-Node network.
- Reassemble the components back onto the base.
- Repeat steps 2 through 5 for as many K70 Wireless Touch Buttons as are needed for your network.
- After binding all K70s, exit binding mode on the Gateway.
  - For board modules, double-click the button.
  - For housed models, double-click button 2.

## LED Behavior for the Nodes

Nodes do not sample inputs until they are communicating with the Gateway. The radios and antennas must be a minimum distance apart to function properly. Recommended minimum distances are:

- 900 MHz 150 mW radios: 6 feet
- 900 MHz 1 Watt radios: 15 feet
- 2.4 GHz 65 mW radios: 1 foot

LED (Bi-color)	Node Status
Flashing green	Radio link okay
Green and red flashing alternately	In Binding mode
Both colors are solid for 4 seconds, then flash 4 times; looks amber	Binding mode is complete
Flashing red, once every 3 seconds	Radio link error
Flashing red, once every second	Device error

## Sure Cross® User Configuration Tool

The User Configuration Tool (UCT) software runs on any Windows machine and uses a USB to RS-485 adapter cable to connect your Gateway to the computer.



The User Configuration Tool (UCT) offers an easy way to link I/O points in your wireless network, view I/O register values graphically, and set system communication parameters when a host system is not part of the wireless network. Download the most recent revisions of the UCT software from Banner Engineering's website: <http://www.bannerengineering.com/wireless>.

The UCT requires a special USB to RS-485 (model number BWA-UCT-900 for 1 Watt radios, BWA-HW-006 can be used for all other radios) converter cable to pass information between your computer and the Gateway.

## Creating Flash Patterns

Use the User Configuration Tool (UCT) to set the Duty Cycle, For Outputs of Node 1, output 9, to 0x0F0F as shown below, to achieve this flash pattern.

Flash a K70 light by entering a time-based bit mask into the Duty Cycle parameter for that output register. Bit 0 represents the first 62.5 ms time window, bit 1 represents the second 62.5 ms window, etc.

For example, turn ON the output from 0 to 250 ms, OFF from 250 to 500 ms, ON from 500 to 750 ms, then OFF again from 750 ms to 1 second by writing 0x0F0F to the appropriate output.

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Bin	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
Hex	0				F				0				F			
Light	Turned off from 750 ms to 1 s				Turned on from 500 to 750 ms				Turned off from 250 to 500 ms				Turned on from 0 to 250 ms			

This example shows 0F0F being written to the Duty Cycle, For Outputs parameter for Node 1, output 9.

### Device Parameters

Show Value as:  Integer  Hexadecimal

Device	I/O Number	Parameter	Value
Node 1	9	Duty Cycle, For Outputs	F0F

**Duty Cycle (Outputs only) (bits 15:0).** This parameter defines the proportion of time the output is active. Using the 16-bit field, each "on" bit represents 1/16 seconds. For example, 0000 0000 0000 1111 (0x000F) sets the duty cycle to 1/4 seconds; 0000 0000 0000 0011 (0x0003) sets the duty cycle to 1/8 seconds. (Parameter number 0x04).

Supported in Gateway RF Firmware Version 2.7 and above.  
Supported in Node RF Firmware Version 1.0 and above.

## Modbus Registers

I/O	Modbus Holding Register		I/O Type	I/O Range		Holding Register Representation (Dec.)		Color #
	Gateway	Any Node		Min.	Max.	Min.	Max.	
1	1	1 + (Node# × 16)	Touch Input 1	0	1	0	1	
7	7	7 + (Node# × 16)	Reserved					
8	8	8 + (Node# × 16)	Device Message					
9	9	9 + (Node# × 16)	Discrete OUT 9	0	1	0	1	Color 1
10	10	10 + (Node# × 16)	Discrete OUT 10	0	1	0	1	Color 2
11	11	11 + (Node# × 16)	Discrete OUT 11	0	1	0	1	Color 3
15	15	15 + (Node# × 16)	Control Message					
16	16	16 + (Node# × 16)	Reserved					

Use the User Configuration Tool (UCT) software to define unique synchronous flash patterns for the lights.

## Specifications

### Touch Button

#### Supply Voltage

12 to 30 V dc (Outside the USA: 12 to 24 V dc, ± 10%) <sup>1</sup>  
 900 MHz Consumption: Maximum current draw is < 40 mA and typical current draw is < 30 mA at 24 V dc. (2.4 GHz consumption is less.)

#### Supply Current

< 220 mA maximum current at 12 V dc  
 < 110 mA maximum current at 30 V dc

#### Supply Protection Circuitry

Protected against transient voltages

#### Construction

Polycarbonate

#### Connections

Integral 5-pin M12/Euro-style male quick disconnect (QD); 150 mm (6 in) pigtail PVC cable with a 5-pin M12/Euro-style male quick disconnect (QD); or a 2 m (6.5 ft) unterminated 5-wire cable depending on the model ordered

#### Operating Conditions

-40 °C to +50 °C (-40 °F to +122 °F)  
 95% at +50 °C maximum relative humidity (non-condensing)

#### Environmental Rating

IEC IP65

#### Vibration and Mechanical Shock

Vibration 10 Hz to 55 Hz 0.5 mm p-p amplitude per IEC 60068-2-6  
 Shock 15G 11 ms duration, half sine wave per IEC 60068-2-27

#### Certifications



#### Indicator Response Time

Off Response: 150 µs (maximum) at 12 to 30 V dc  
 On Response: 180 ms (maximum) at 12 V dc; 50 ms (maximum) at 30 V dc

#### Indicators

1 to 3 colors depending on model: Green, Red, Yellow, Blue, and White LEDs are independently selected

#### 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 <http://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

<sup>1</sup> For European applications, power this device from a Limited Power Source as defined in EN 60950-1.

## Radio

### Radio Range<sup>2</sup>

900 MHz, 1 Watt (Internal antenna): Up to 3.2 km (2 miles)  
 2.4 GHz, 65 mW (Internal antenna): Up to 1000 m (3280 ft) with line of sight

### Minimum Separation Distance

900 MHz, 1 Watt: 4.57 m (15 ft)  
 2.4 GHz, 65 mW: 0.3 m (1 ft)

### 900 MHz Compliance (1 Watt)

FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247  
 IC: 7044A-RM1809

### 2.4 GHz Compliance

FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247  
 ETSI EN 300 328 V1.8.1 (2012-06)  
 IC: 7044A-DX8024

### Radiated Immunity HF

10 V/m (EN 61000-4-3)

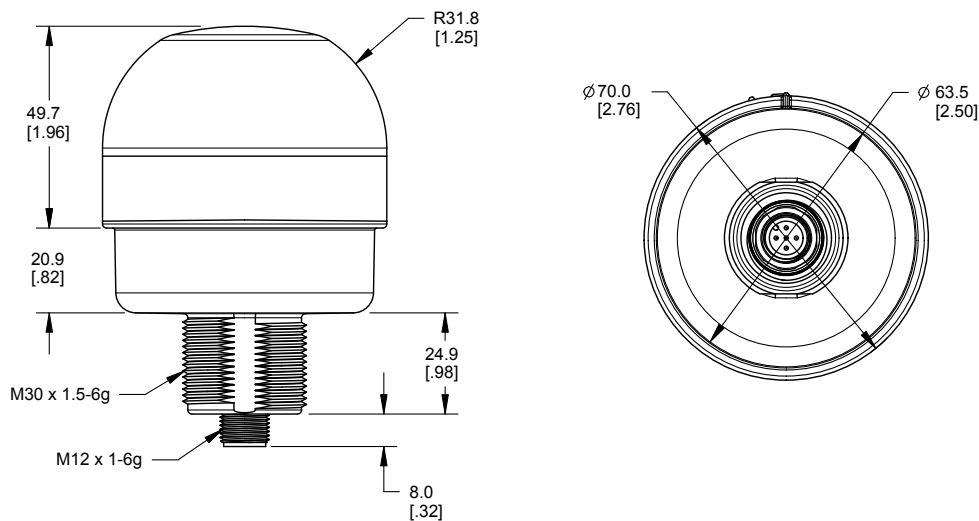
### Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

### Link Timeout

Gateway: Configurable via User Configuration Tool (UCT) software  
 Node: Defined by Gateway

## Dimensions



All measurements are listed in millimeters (inches), unless noted otherwise.

## Accessories

### Cordsets

5-Pin Threaded M12/Euro-Style Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC1-501.5	0.50 m (1.5 ft)	Straight		
MQDC1-506	1.83 m (6 ft)			
MQDC1-515	4.57 m (15 ft)			
MQDC1-530	9.14 m (30 ft)			

<sup>2</sup> Radio range significantly decreases without line of sight. Always verify your wireless network's range by running a site survey.

5-Pin Threaded M12/Euro-Style Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC1-506RA	1.83 m (6 ft)	Right-Angle		
MQDC1-515RA	4.57 m (15 ft)			
MQDC1-530RA	9.14 m (30 ft)			

All measurements are listed in millimeters, unless noted otherwise.

Mounting Brackets

<p><b>SMB30A</b></p> <ul style="list-style-type: none"> <li>• Right-angle bracket with curved slot for versatile orientation</li> <li>• Clearance for M6 (¼ in) hardware</li> <li>• Mounting hole for 30 mm sensor</li> <li>• 12-ga. stainless steel</li> </ul> <p>Hole center spacing: A to B=40 Hole size: A=ø 6.3, B= 27.1 x 6.3, C=ø 30.5</p>	<p><b>SMB30MM</b></p> <ul style="list-style-type: none"> <li>• 12-ga. stainless steel bracket with curved mounting slots for versatile orientation</li> <li>• Clearance for M6 (¼ in) hardware</li> <li>• Mounting hole for 30 mm sensor</li> </ul> <p>Hole center spacing: A = 51, A to B = 25.4 Hole size: A = 42.6 x 7, B = ø 6.4, C = ø 30.1</p>
<p><b>SMBAMS30P</b></p> <ul style="list-style-type: none"> <li>• Flat SMBAMS series bracket</li> <li>• 30 mm hole for mounting sensors</li> <li>• Articulation slots for 90° + rotation</li> <li>• 12-ga. 300 series stainless steel</li> </ul> <p>Hole center spacing: A=26.0, A to B=13.0 Hole size: A=26.8 x 7.0, B=ø 6.5, C=ø 31.0</p>	<p><b>SSA-MBK-EEC1</b></p> <ul style="list-style-type: none"> <li>• Single 30 mm hole</li> <li>• 8 gauge steel, black finish (zinc-plated)</li> <li>• Front surface for customer applied labels</li> </ul> <p>Hole size: A = ø 7 , B = ø 30</p>

All measurements are listed in millimeters, unless noted otherwise.

## Banner Engineering Corp. Limited Warranty

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