Korry

Illuminating. Always.

Mag-Latch 389 Switch

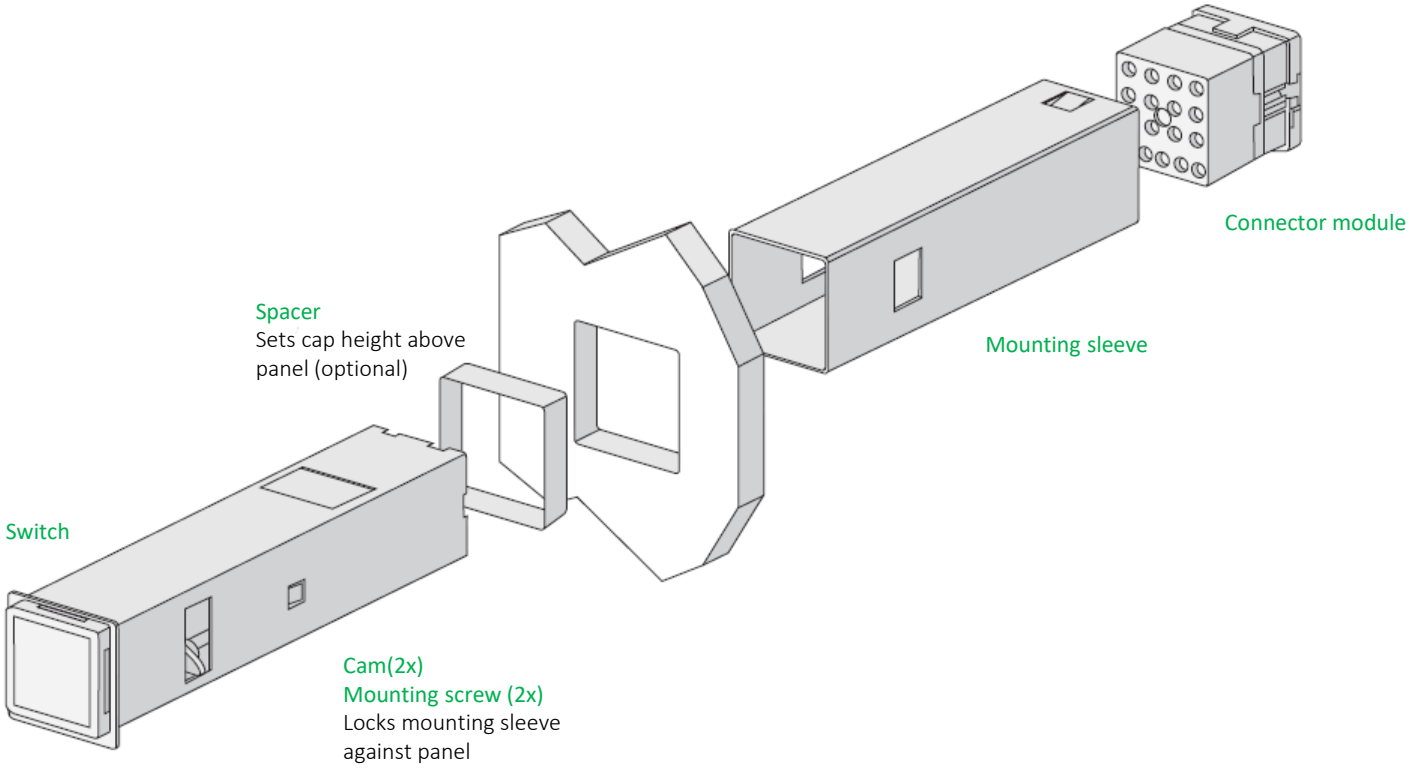
Korry 389 LED illuminated 5/8-inch switch

Korry offers its 389 5/8-inch LED switches with the capability to remotely release the switch position when power is removed from the holding coil. The magnetic latching 389 version features an electromagnetic coil that remotely changes the switch contact position through an external circuit.

Applications include engine ignition, electronic interlocks, and safety mechanisms to turn off a system when power is lost.

The mag-latch 389 switch delivers uncompromising performance in system interface capabilities and lighting characteristics. The unit is designed for demanding environments and can be found on most commercial and military platforms.

Single-Sleeve Mounting Configuration



Electrical and Operating Characteristics

Property	Characteristics
Switch type	Momentary / alternate action, four pole, double throw, form C, single break microswitch IAW MIL-PRF-8805
Switch contact ratings	Resistive: sea level 7A at 28 VDC Inductive: sea level at 4A at 28 VDC Lamp: sea level 2.5A at 28VDC
LED current rating	35mA max at 28 VDC, bright mode, full display
Total cap travel	0.165 inch max. (4.19 mm)
Actuation force	2-5 pounds (0.91-2.27 kg)
Cap extraction	2-5 pounds (0.91-2.27 kg)
Mounting torque	16-20 inch-ounces
Holding coil	110 mA maximum at 32 VDC
Actuation life	100,000 cycles (MIL-PRF-22885)
Temperature	-55° C to +85° C (MIL-PRF-22885)

Environmental

Test	Specification
Contact resistance	MIL-STD-202F, Method 307 (analysis)
Contact bounce	MIL-PRF-22885F, Para. 4.7.5 (analysis)
Coincidence of operating and releasing points	MIL-PRF-22885/110 (analysis)
Touch temperature	MIL-PRF-22885/109A(USAF) (analysis)
Thermal shock	MIL-STD-202F, Method 107G, Condition A
Vibration	MIL-STD-202F, Method 204, Test Condition B (10 Hz - 2000 Hz)
Shock	MIL-STD-202F, Method 213B, Condition B
Acceleration	MIL-PRF-22885F, Para. 4.7.17
Moisture resistance	MIL-STD-202F, Method 106F
Insulation resistance	MIL-STD-202F, Method 302, Condition B (at atmospheric pressure)
Dielectric withstanding voltage	1,100 VRMS for 60 seconds, followed by 500 VRMS for 5 seconds. MIL-STD-202F, Method 301 (at atmospheric pressure) MIL-STD-202F, Method 105C, Condition B (at reduced pressure)
Marking visibility	Korry specification drawing (analysis)
Salt spray	MIL-STD-202F, Method 101D, Condition A
Explosion	MIL-STD-202F, Method 109B
Sand and dust	MIL-STD-202F, Method 110A
Overload cycling	MIL-PRF-22885F, Para.4.7.27 (analysis)
Electrical endurance	MIL-PRF-22885F, Para. 4.7.28, MIL-PRF-22885/109A(USAF), Table IX, Note 3 (analysis)
Mechanical endurance	MIL-PRF-22885F, Para. 4.7.29
Mechanical life	Bell/Textron Specification 120-257
Power	RTCA/DO-160D, Sections 16 and 17
Normal and abnormal DC steady state	RTCA/DO-160D, Sec. 16.5.2.1, Cat. Z; RTCA/DO-160D, Sec. 16.5.4.1, Cat. Z Additional maximum input voltage for 1 minute in reverse polarity.
Normal surge voltage (DC)	RTCA/DO-160D, Sec. 16.5.2.4, Category Z
Abnormal surge voltage (DC)	RTCA/DO-160D, Sec. 16.5.4.4, Category Z
Voltage spike	RTCA/DO-160D, Section 17, Category B
Audio frequency conducted susceptibility	RTCA/DO-160D, Section 18, Category Z
Magnetic effect	RTCA/DO-160D, Section 15, Category Z
Induced signal susceptibility	RTCA/DO-160D, Section 19, Category Z
Radio frequency susceptibility	MIL-STD-461D, RS103, 200 v/m
Radio frequency emission	RTCA/DO-160D, Section 21, Category M
Temperature / altitude	MIL-STD-810C, Method 504.1, Category 1

Reliability

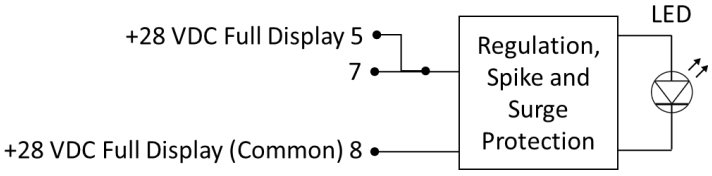
The Korry 389 switch has an MTBF of 1.5 million hours, which varies by configuration and application. The 1.5-million-hour MTBF is for a standard full display, assuming a 20-degree Celsius ambient operating temperature and 3,000 flying hours per year. This prediction was performed using 217 Plus from RiAC™ software.

Mag-Latch 389 Lamp Circuit Diagrams

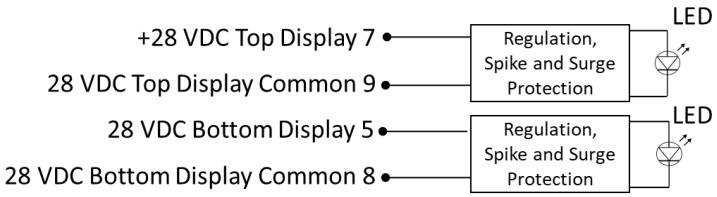
Shown are examples of standard circuits. Other options are available upon request.
Terminal designations are for reference only.

Represents an LED array

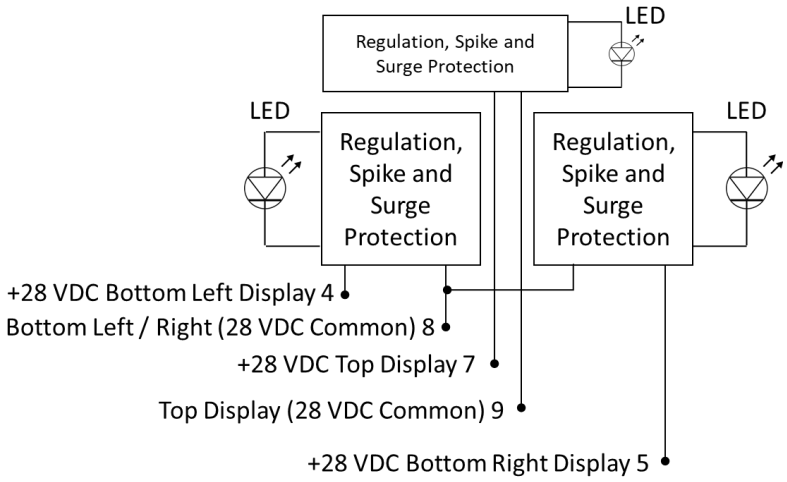
7-Pin Lamp Circuit – accepts M39029/22-192 crimp pins, accepts AWG 20, 22 and 24



FULL DISPLAY

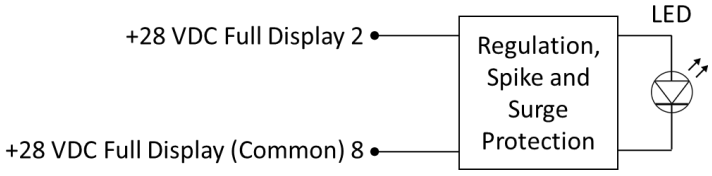


SPLIT DISPLAY

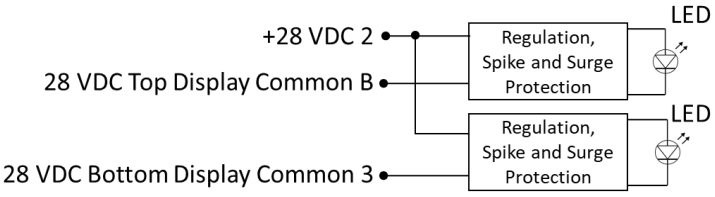


3-WAY SPLIT DISPLAY

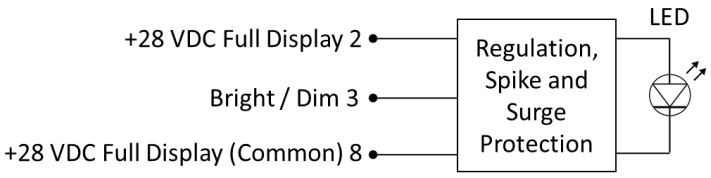
5-Pin Lamp Circuit – accepts M29029/22-192 crimp pins, accepts AWG 20, 22 and 24



FULL DISPLAY

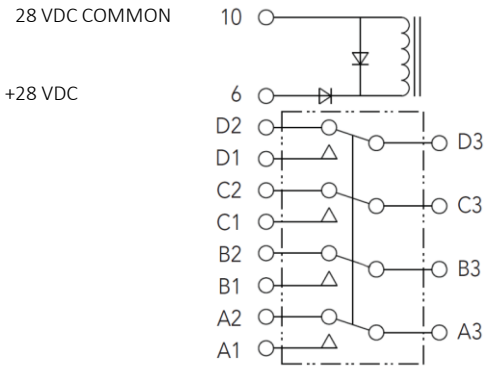


SPLIT DISPLAY



FULL DISPLAY BRIGHT / DIM

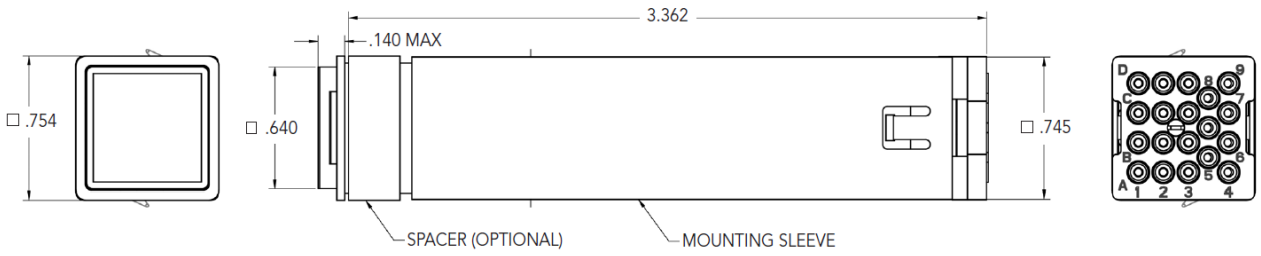
Switch Circuit Diagram



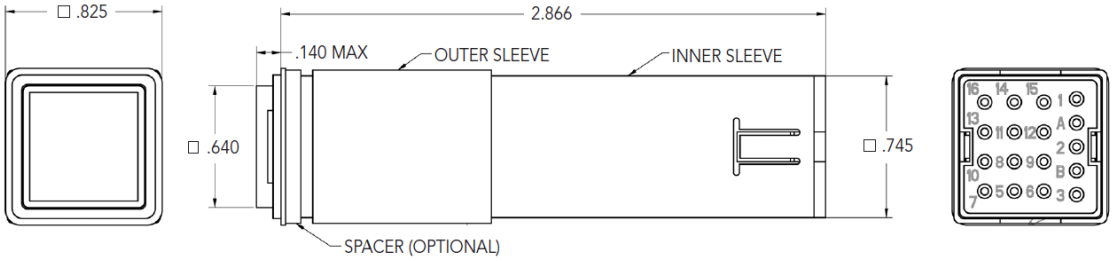
Electromagnetic coil and subminiature switch interface for both 7-pin and 5-pin versions

Mag-Latch 389 Configuration Envelopes and Panel Cutouts
(dimensions in inches)

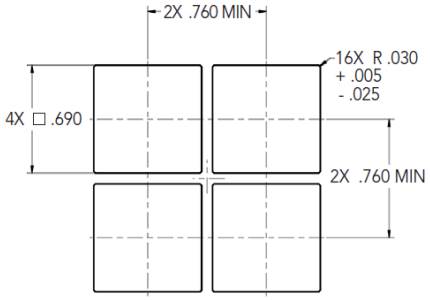
Single Sleeve Mounting and Connector Module with 7-Pin Lamp Circuit
(Also available in double sleeve mounting)



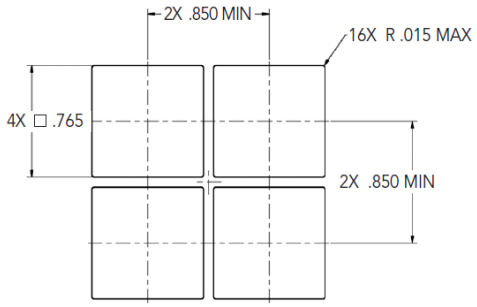
Double Sleeve Mounting and Connector Module with 5-Pin Lamp Circuit
(Also available in single sleeve mounting)



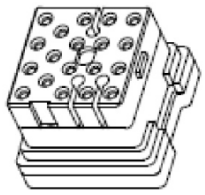
Panel Cutout for Single Sleeve



Panel Cutout for Double Sleeve

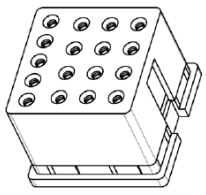


7-Pin Connector Module



7-pin connector module uses M39029/22-192 crimp pins, accepts AWG 20, 22 and 24

5-Pin Connector Module

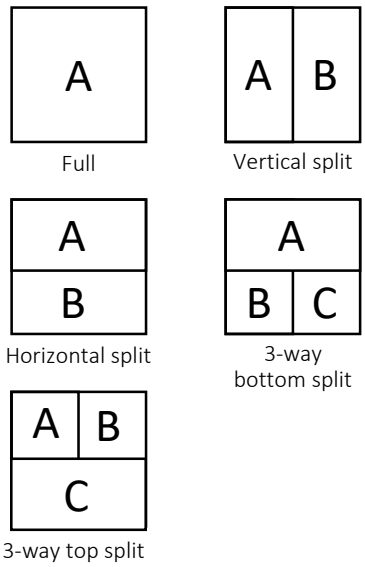


5-pin connector module uses M39029/22-192 crimp pins, accepts AWG 20, 22 and 24

Legends

Legend Types	Non-Energized Condition	Energized Condition
S (1B) Hidden legend. Letters not visible until illuminated. Lighted colored letters on opaque black background when energized		KORRY
B (1C) Hidden legend. Letters not visible until illuminated. Lighted colored background with opaque black letters when energized		KORRY
W (2D) Opaque black letters on white background. Background shows color when energized	KORRY	KORRY
N (2G2) White letters on opaque black background. Letters show color when energized	KORRY	KORRY
C (2B) Opaque black letters on colored background. Lighted colored background when energized	KORRY	KORRY
(2F) Opaque white letters on dark background. Background shows color when energized	KORRY	KORRY

Lens Configurations



Fonts

Legends are available in many fonts and character heights.
Please contact us for details about your specific request

Commonly Used Fonts

FUTURA MEDIUM	FUTURA MEDIUM CONDENSED	HELVETICA MEDIUM
HELVETICA MEDIUM CONDENSED	GORTON NORMAL	GORTON CONDENSED
GORTON EXTRA CONDENSED	NEWS GOTHIC	DIN MITTELSCHRIFT 1451
DIN ENGSCHRIFT 1451		

Character heights between 0.090” - 0.125”

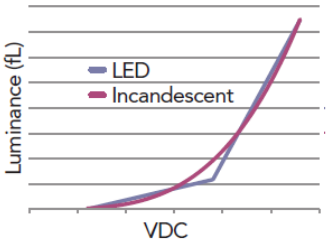
Optical Characteristics

	Luminance		Chromaticity		Contrast	
	Dim @ 14 VDC	Bright @ 28 VDC	X	Y	On	Off
RED	10 ± 5	200 - 500	0.670	0.334	0.6 Min	0 ± 0.1
			0.670	0.310		
			0.695	0.285		
			0.710	0.292		
AMBER	10 ± 5	200 – 500	0.570	0.430	0.6 Min	0 ± 0.1
			0.560	0.420		
			0.600	0.380		
			0.610	0.390		
GREEN	10 ± 5	200 – 500	0.200	0.640	0.6 Min	0 ± 0.1
			0.200	0.740		
			0.320	0.740		
			0.320	0.640		
BLUE	10 ± 5	150 – 400	0.140	0.250	0.4 Min	0 ± 0.1
			0.140	0.150		
			0.200	0.150		
			0.200	0.250		
WHITE	10 ± 5	200 - 500	0.280	0.270	0.6 Min	0 ± 0.1
			0.280	0.370		
			0.340	0.370		
			0.340	0.270		

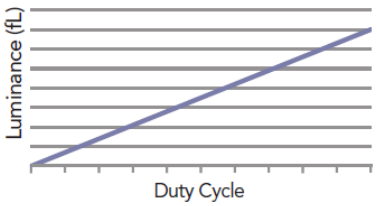
- Luminance and color requirements are for legend types S (1B), B (1C), W (2D), C (2B), and (2F)
- Type N legends are used for night visibility and are designed to match the light-plate luminance value
- NVIS colors are available per MIL-STD-3009
- Korry products meet the night-vision compatibility requirements of MIL-STD-3009
- Contrast shown is for S legends only
- Other optical characteristics are available upon request

Dimming Methodologies

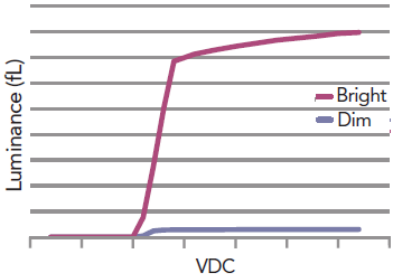
Variable Voltage



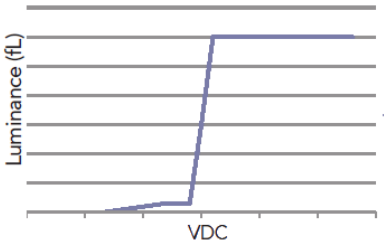
Pulse Width Modulation (PWM)



Constant Illumination over Variable Voltage



Programmable



Logic Input

2-to-4-point dimming using multiple ground pins

389 Switch Accessories

Sealing accessories

To meet higher requirements than those listed in the environmental specifications, the following sealing options are available.

	Drip proof	Sand and dust	Waterproof	Humidity	Spill proof	Salt fog
Wiper seal *	X	X				
Internal seal *		X		X		X
External seal *	X	X	X	X	X	X
Bellows seal *	X	X	X	X	X	X

* Panel seals are also available

Electrical Interface Accessories

- M39029 crimp pins: solder-less wire connections that can easily be removed and reinstalled into the connector module
- Connector module: a standard electrical interface that accommodates the M39029 crimp-pin feature
- PCB header: for installation onto a PCB or CCA

Miscellaneous Accessories

- Spacers: available for insertion between the mounting panel and housing flange to position the cap assembly level with an adjacent light plate
- Mounting sleeves: Different mounting-sleeve configurations compatible with either the connector module or PC-header electrical interface
    - Single sleeve: used with the connector module interface to secure the switch around the mounting panel. This sleeve does not allow for the switch to be replaced from the front of the panel. Access to the rear of the mounting panel is required
    - Double sleeve: used with the connector module interface. This sleeve allows for the switch to be replaced from the front of the panel
- Flip-guard assembly: multiple styles available to prevent inadvertent switch actuation
- Connector-module extraction tool: M22885/108T8234.

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