

Korry® 389 LED-Illuminated 5/8-Inch Switch

A virtual industry standard for versatile, reliable switching solutions with outstanding illumination

Korry 389 high-performance 5/8-inch LED switches with magnetic-coil latching for remote release

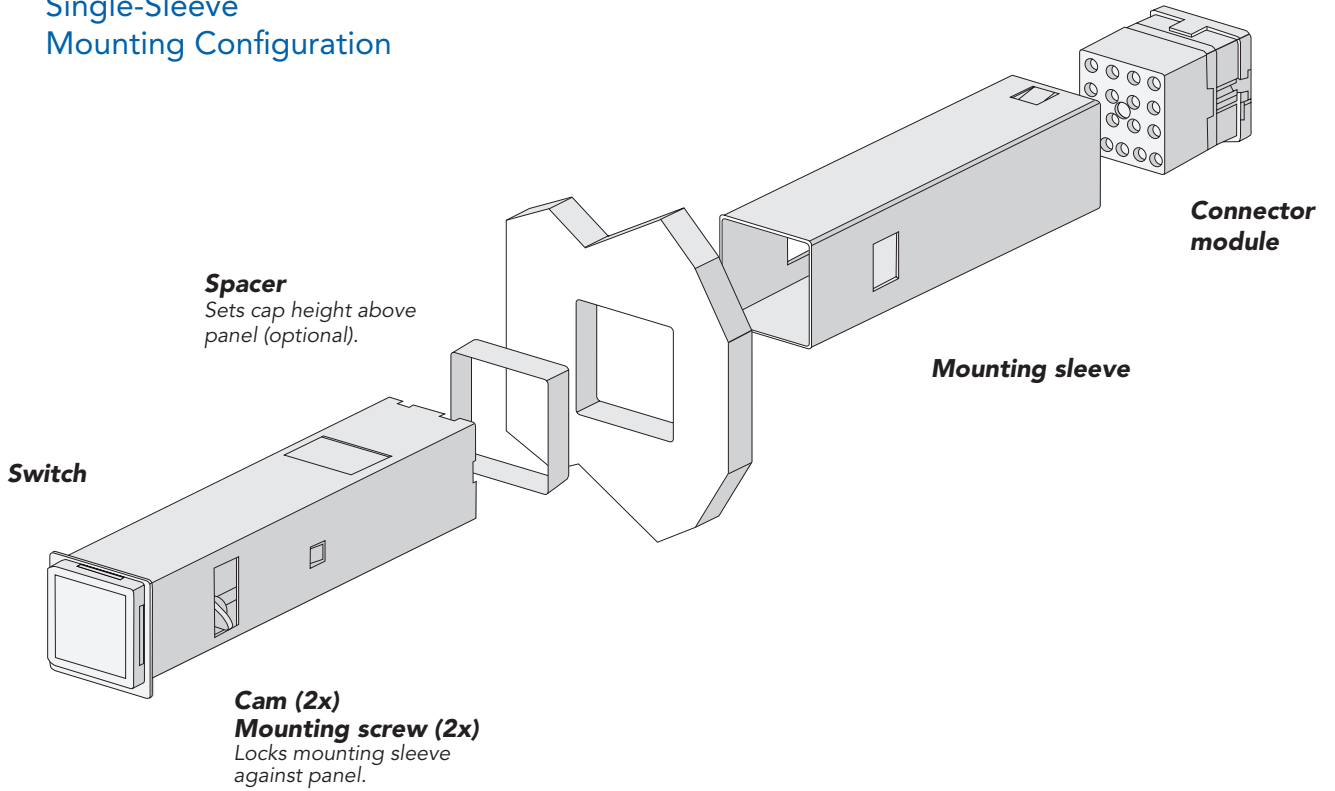
Esterline offers its Korry 389 5/8-inch LED switches with the capability to remotely release the switch position when power is removed from the switch. The magnetic-latching 389 version features an electromagnetic coil that remotely changes the switch contact position through an external circuit. Applications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

- Surface-mounted electronics with the latest generation of high-brightness LEDs
- Life-of-the-aircraft component with MTBF 150,000 illumination hours and 100,000 mechanical life cycles
- Reverse-voltage, lightning-strike, and voltage-surge protection
- Bipolar electrical interface
- Uncompromising performance in system interface capabilities
- Low coil current: 110 mA maximum at 32 VDC
- Exceptional illumination characteristics such as brightness output and dimming control
- Optional night-vision illumination
- Subminiature switching for low-level logic-current and high-current applications

Korry Mag-Latch 389 Assembly and Installation

Single-Sleeve Mounting Configuration



Electrical and Operating 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 7 A at 28 VDC Inductive: sea level 4 A at 28 VDC Lamp: sea level 2.5 A at 28 VDC
LED current rating	35 mA 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)

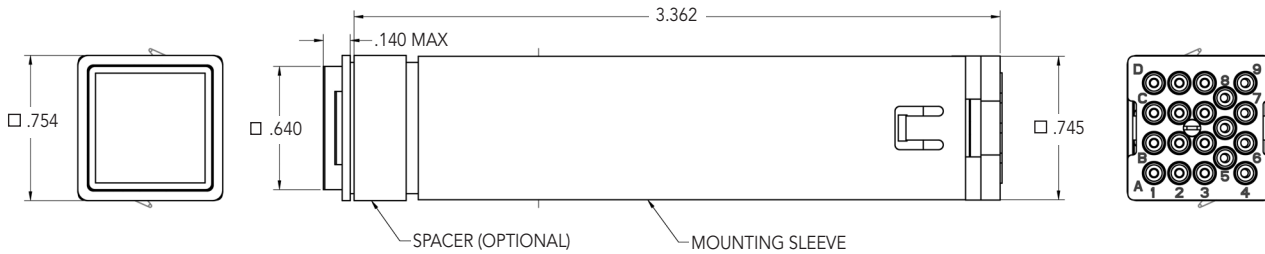


Mag-Latch 389 Configuration Envelopes and Panel Cutouts

(dimensions in inches)

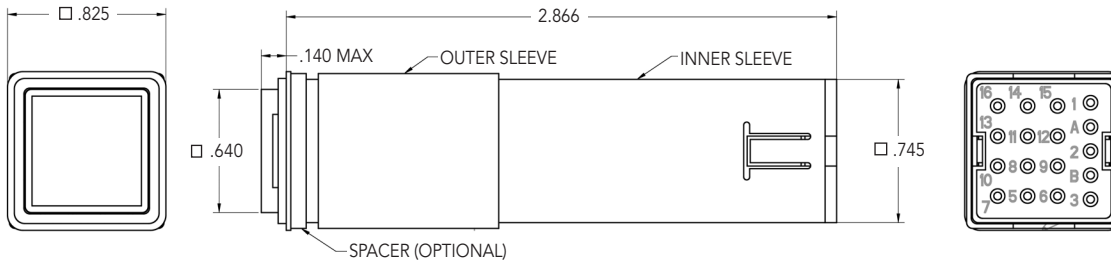
7-Pin Single Sleeve and Connector Module

(also available in double-sleeve mounting)

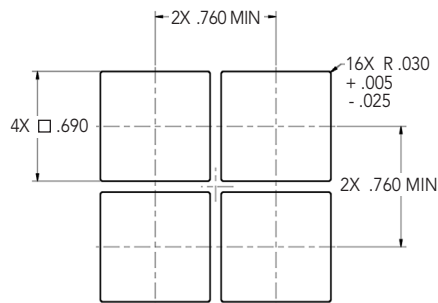


5-Pin Double Sleeve and Connector Module

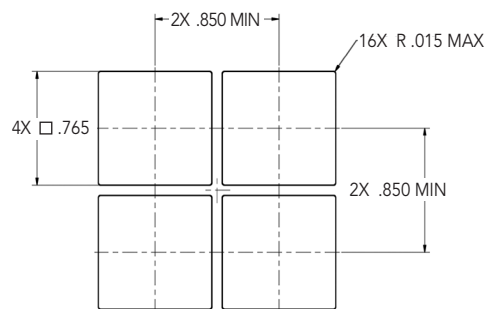
(also available in single-sleeve mounting)



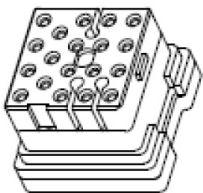
Panel Cutout for Single Sleeve



Panel Cutout for Double Sleeve

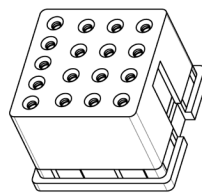


7-Pin Connector Module



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

5-Pin Connector Module



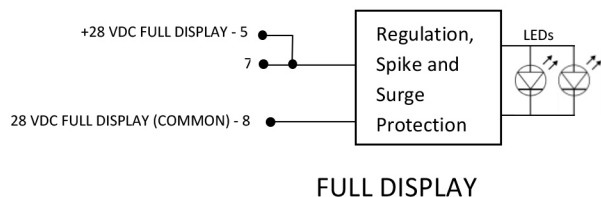
5-pin connector module uses M39029/22-192 crimp pins, accepts AWG 20, 22 and 24.

For additional information, please email korry.techinfo@esterline.com

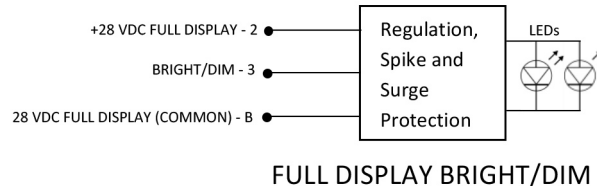
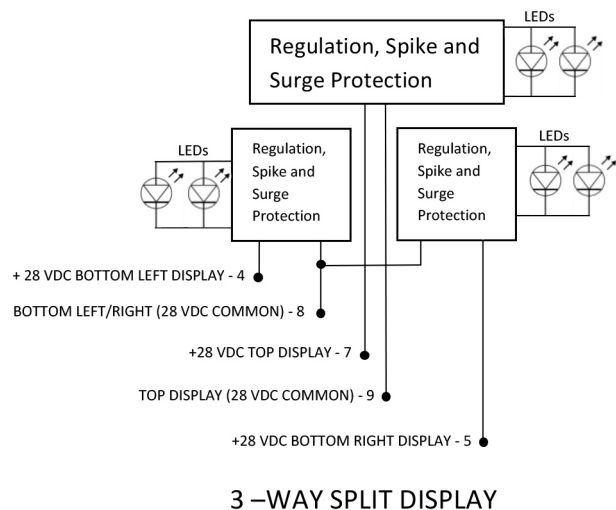
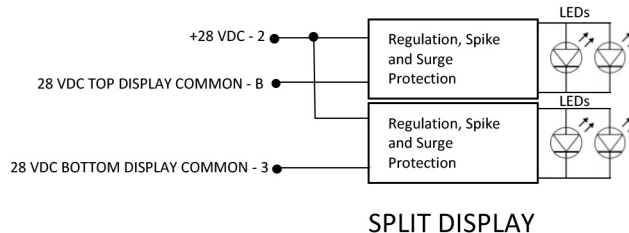
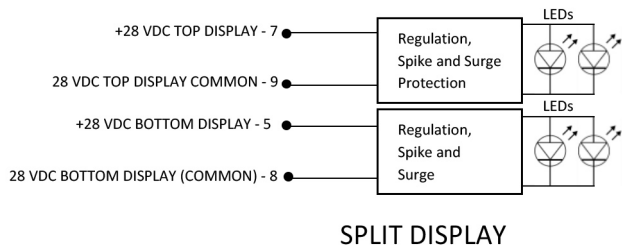
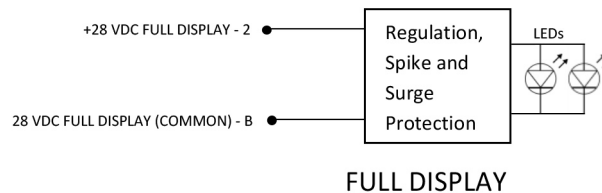
Mag-Latch 389 Electrical Schematics and Interface Options

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

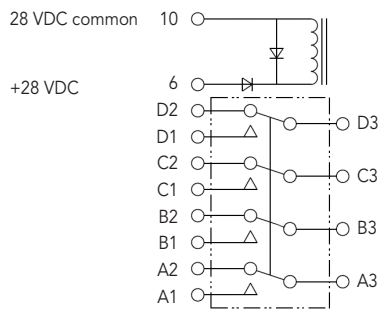
7-Pin Lamp Circuit (bipolar design)



5-Pin Lamp Circuit (bipolar design)



Switch Circuit



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

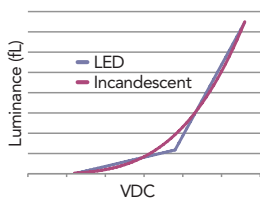
Optical Characteristics

	Luminance (fL)		Chromaticity		Contrast	
	Dim @ 14 VDC	Bright @ 28VDC	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		

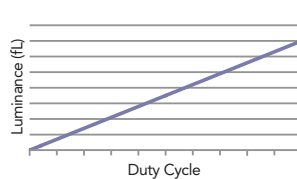
- Luminance and color requirements are for legend types S (1B), B (1C), W (2D), N (2G2), C (2B), and (2F).
- Type N legends are used for night visibility and are designed to match the light-plate luminance value.
- NVIS colors are available per MIL-STD-3009.
- Korry products meet the night-vision compatibility requirements of MIL-STD-3009.
- Contrast shown is for S legends only.
- Other optical characteristics are available upon request.

Dimming Methodologies

Variable Voltage



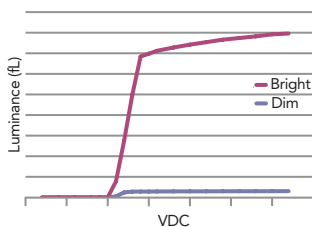
Pulse Width Modulation (PWM)



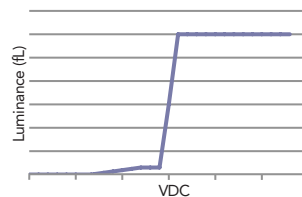
Logic Input

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

Constant Illumination over Variable Voltage



Programmable



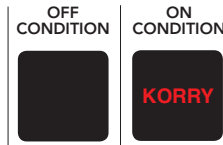
For additional information, please email korry.techinfo@esterline.com

Legends

Legend Types

S (1B)

Hidden legend. Letters not visible until illuminated. Lighted colored letters on opaque black background when energized.



B (1C)

Hidden legend. Letters not visible until illuminated. Lighted colored background with opaque black letters when energized.



W (2D)

Opaque black letters on white background. Background shows color when energized.



N (2G2)

White letters on opaque black background. Letters show color when energized.



C (2B)

Opaque black letters on colored background. Lighted colored background when energized.

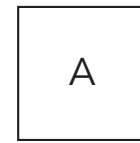


(2F)

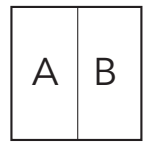
Opaque white letters on dark background. Background shows color when energized.



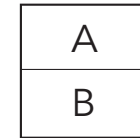
Lens Configurations



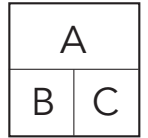
Full



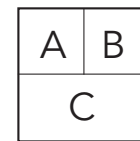
Vertical split



Horizontal split



3-way split



3-way B split

Fonts and Sizes Versus Character Capacities

	Character height	TEXT		TEXT		TXT		TT TT TT	
		Lines	Characters per line	Lines	Characters per line	Lines	Characters per line	Lines	Characters per line
Futura Medium	.093	1-4	6	1-2	6	1	2	1	4
	.125	1-3	4	1	4	1	2	1	3
Futura Medium Condensed	.090	1-4	9	1-2	9	1	3	1-2	4
	.125	1-3	7	1	7	1	3	1	3
Helvetica Medium	.093	1-4	5	1-2	5	1	2	1	4
	.125	1-3	4	1	4	1	2	1	3
Helvetica Medium Condensed	.093	1-4	7	1-2	7	1	3	1	4
	.125	1-3	5	1	5	1	2	1	3
GORTON NORMAL	.093	1-4	6	1-2	6	1	2	1	4
	.125	1-3	4	1	4	1	2	1	3
GORTON NORMAL CONDENSED	.093	1-4	7	1-2	7	1	3	1-2	4
	.125	1-3	5	1	5	1	2	1	3
GORTON EXTRA CONDENSED	.093	1-4	9	1-2	9	1	3	1-2	4
	.125	1-3	7	1	7	1	2	1	3
News Gothic	.093	1-4	6	1-2	6	1	2	1-2	4
	.125	1-3	5	1	5	1	2	1	3
DIN Mittelschrift 1451	.093	1-4	6	1-2	6	1	2	1	4
	.125	1-3	4	1	4	1	2	1	3
DIN Engschrift 1451	.093	1-4	9	1-2	9	1	3	1-2	4
	.125	1-3	6	1	6	1	2	1	3

Number of characters per line can vary depending on characters selected. Other fonts are available upon request.

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)
Contact resistance	MIL-STD-202F, Method 307 (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 C ambient operating temperature and 3,000 flying hours per year. This prediction was performed using 217 Plus from RiACT™ software.

For additional information, please email korry.techinfo@esterline.com

389 Switch Accessories

Sealing Accessories

To meet higher requirements than those listed in the environmental specifications (page 6), 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 lightplate.
- Mounting sleeves: two 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.

Custom Options

For specific applications, custom circuits and lighting are available upon request.

Find out more about Korry 389 switches at www.esterline.com/controlandcommunication, or contact us at +1-425-297-9700 or korry.techinfo@esterline.com.

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Esterline
Control &
Communication Systems

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