

## HONEYWELL TL MICRO SWITCH MILITARY GRADE TOGGLE SWITCHES

Toggle switches have become almost ubiquitous in designs for aerospace, defense, and industrial products. With a variety of toggle switches available on the market today, it can be hard to navigate the options. Specific applications may also require specialized toggle switches, with design features and customizations fit for different environments and tasks. Military-grade toggle switches, for example, must be durable, reliable, and with long lifespan, while still considering costs, availability, and specifications.

Since the 1930s, Honeywell has been manufacturing toggle switches, and, currently, its military-qualified TL Micro Switch line provides a potential solution for numerous applications. This whitepaper discusses the TL Micro Switch toggle switch, including a quick overview of toggle switches and some history regarding the general Honeywell Micro Switch line. The design, differentiators, key features, and specifications follow, with an extensive section on possible customizations. Finally, the most common applications are summarized.

### TOGGLE SWITCHES OVERVIEW

Toggle switches are electric switches used to control electric circuits and serve as an effective operator interface (OI) for switching machines or functionality on/off. “Toggle” refers to the handle, lever, or hinge that moves from one position to another. Toggle switches are easy to use and intuitive, providing tactile feedback and allowing users to throw a switch with minimum effort. While many brands of these switches are on the market, Honeywell Micro Switches offer many advantages.

The Honeywell [Micro Switches](#) has been a brand name going since 1932. Invented by Peter McGall, a mechanic at the Burgess Battery Company, it was developed as a precision switching solution for chicken brooders. Later, Burgess founded the Micro Switch company. The Micro Switch trademark has been owned by Honeywell since the 1950s — these trademarked toggles are often mistakenly used to refer to miniature snap-action switches in general.

The engineering and materials used for these switches have evolved over the years to meet new challenges and take advantage of innovative technology. This long-standing, proprietary foundation gives Micro Switch products their high reliability and precision performance. This product line of toggle switches enhances output, safety, and endurance for whatever application they are used in.



**Figure 1.** Honeywell offers a variety of Micro Switches. [Source.](#)

Micro Switches, such as the one shown in Figure 1, require very little physical force to toggle them, unlike some other brands of snap-action or toggle switches. Only a small movement of the toggle produces extensive movement and high-speed connection at the contacts (regardless of the speed at which the toggle is moved). In addition, switching occurs at specific, repeatable positions of the actuator. This feature can be critical for many applications, including mission-critical aerospace and defense tasks, further enhancing their high reliability.

## HONEYWELL TL MICRO SWITCH MILITARY-GRADE TOGGLE SWITCHES

Honeywell [TL Micro Switch Military-Grade Toggle Switches](#), shown in Figure 2, provide an operator interface (OI) for various aerospace, transportation, and industrial applications. These military-grade switches are reliable, durable, and high-performance, enhancing productivity and safety. The TL switches are also highly configurable, making them an ideal option for any number of applications, regardless of complexity.



**Figure 2.** A typical Honeywell TL military-grade Micro Switch. [Source.](#)

## DESIGN

These military-grade toggle switches are designed to resist hazards in their operating environment. They have a one-piece, 15/32 in bushing along with a cover and seals around the terminals, a sealed switching chamber, molded-in elastomer gasket seals, and a molded elastomer seal around the toggle itself. These toggle switches also have a high-strength, temperature-resistant, non-tracking case, and silver cadmium oxide contacts.

## KEY FEATURES AND DIFFERENTIATORS

[Honeywell TL Micro Switch](#) military-grade toggle switches are engineered for high performance even in some of the harshest operating environments. They are also UL-recognized, CSA-certified, and CE (European Conformity) and UKCA (United Kingdom Conformity Assessed) approved.

These toggle switches are built from military-grade components to achieve MIL-DTL-3950 requirements for sealed toggle switches. They have a completely sealed switching chamber and include a bonded seal between the toggle lever and bushing and between the cover and case.

Built for rugged environments, these toggle switches continue to perform even when subjected to mechanical shock, vibration, temperature extremes (i.e., -65 °C to 71°C), and operating environments with dust, splashing, or hose-directed water. Their resistance to dust, moisture, and liquids is achieved through sealing in compliance with IP67/68 and NEMA 3, 3R, 4, and 13.

In addition, the actuator/lever in the TL Micro Switches are available in 2- or 3-position, momentary, and maintained positions while providing enhanced tactile feedback. They have locking levers that reduce unintentional actuation and include a step-design case that provides added space between terminals to prevent problems with electrical shorting.

## SPECIFICATIONS














With AC and DC capability, the Honeywell TL Micro Switch toggle switches can handle up to 20A. The following items show their basic UL and CSA electrical ratings:

- L191: 15 amps, 125, 250, 277 Vac; ½ Hp, 125 Vac; 1 Hp, 250, 277 Vac; 5 amps, 125 Vac
- L192: 10 amps, 125, 250, 277 Vac; ¼ Hp, 125 Vac; ½ Hp, 250, 277 Vac; 3 amps, 125 Vac “L”

In addition, they have a compact size: 26.7mm H x 33.5mm W x 22.6mm D.

## CUSTOMIZATIONS

There are several customizations available for Honeywell military-grade TL Micro Switches. They are available in 2- and 3-position options, including maintained and momentary toggle action that can be combined with the different locking configurations, summarized in Figure 3, to meet circuit and actuator requirements.

<b>A</b>  Locked In Three Positions	<b>B</b>  Locked In Center and Extreme Position (Keyway Side)	<b>D</b>  Locked Out Of Center Position	<b>E</b>  Locked In Center Position	<b>F</b>  Locked In Extreme Position (Opposite Keyway)	<b>G</b>  Locked In Extreme Position (Keyway Side)	<b>H</b>  Locked Out Of Center And Extreme Position (Keyway Side)
<b>J</b>  Locked Out Of Center And Extreme Position (Opposite Keyway)	<b>K</b>  Locked In Center And Extreme Position (Opposite Keyway)	<b>L</b>  Locked Out Of Extreme Position (Keyway Side)	<b>M</b>  Locked Out Of And Into Extreme Position (Opposite Keyway)	<b>N</b>  Locked Out Of Extreme Position (Opposite Keyway)	<b>P</b>  Locked Out Of And Into Extreme Position (Keyway Side)	

**Figure 3.** Locking configurations. [Source](#).

They are also available for different circuitry, including the special circuitries shown in Figure 4. The six circuitries stand for:

- SPST is Single Pole Single Throw with a single input that connects/disconnects the circuit
- SPDT is Single Pole Double Throw with a single input that connects to one of two outputs
- DPST is Double Pole Single Throw with two inputs (controlled together) that connects/disconnects both circuits simultaneously
- DPDT is Double Pole Double Throw with two inputs (controlled independently), each connecting to one of two outputs
- 4PST is 4 Pole Single Throw with four inputs (controlled together) that connects/disconnects all four circuits simultaneously
- 4PDT is 4 Pole Double Throw with four inputs (controlled independently), each connecting to one of four outputs

**-10 CIRCUITRY**

No of poles	Keyway Side Maint. Position	Center Maint. Position	Opposite Keyway Maint. Position
2			
4			

**-50 CIRCUITRY**

No of poles	Keyway Side Momentary Position	Center Maint. Position	Opposite Keyway Maint. Position
2			
4			

**-70 CIRCUITRY**

No of poles	Keyway Side Momentary Position	Center Maint. Position	Opposite Keyway Momentary Position
2			
4			

**Figure 4.** Special circuitries available in the TL Micro Switch Series. [Source.](#)

They can also be obtained in 1-, 2-, and 4-pole options, along with three termination options: screw, solder lugs, and integrated wire termination system (IWTS). Contacts can be silver alloy or gold-plated, and actuators include standard, locking, special design, and tab.

Because there are hundreds of variations in sealing, circuitry options, sizes, and more, Honeywell’s TL Micro Switch military-grade toggle switches provide solutions for many different aerospace, industrial, and military applications and are able to meet almost any specification.

## APPLICATIONS

The military and commercial aircraft applications for these toggle switches include fixed-wing aircraft, and helicopter flight decks along with aviation ground support equipment and flight controls. Lights, pumps, and lift platforms are also applications for the TL military-grade toggle switches.

These Micro Switches are an excellent solution for military land vehicles (track and wheeled vehicles) that can use them for lights, pumps, arming equipment, and lifts/ramps.

Non-military applications for the Honeywell TL Micro Switches include

- Process control
- End-of-travel syringes
- Refrigeration
- General equipment
- Road milling
- Road paving
- Digging trenches
- Stump cutting
- General-purpose vehicle panel controls

## CONCLUSION

Honeywell Micro Switch toggles have been around for over 80 years, continuously improving and advancing to meet modern needs. The TL Micro Switch toggles are military-qualified to MIL-DTL-3950 specifications for sealed toggle switches. In addition, they are designed to resist some of the most aggressive operating environments, including vibration and shock loadings and temperature extremes.

The TL Micro Switch toggle switches have proven rugged, reliable, high-performance solutions for aerospace, defense, transportation, and industrial applications. Honeywell manufactures many configurations of the TL toggle switches to meet any circuitry requirement, including a number of terminations, circuitries, actuators, and actions.

If you want to learn more, reach out to a Powell representative at [honeywellinfo@powell.com](mailto:honeywellinfo@powell.com) or visit the website [here](#).