Circuit Control in Harsh Environments

DIP Switches for Outdoor Applications

Tech Brief

Electric circuits are naturally susceptible to the environmental influences of their surroundings. Electromagnetic interference, changing temperatures, dust and humidity are just a few examples of factors that will negatively affect the performance of technologies when they operate outside of closed and controlled environments.

As countless technologies are required to operate under circumstances where environmental exposure is unavoidable and uncontrollable, it is essential to carefully select constituent components that are capable of withstanding the wear and tear of their operational environment.

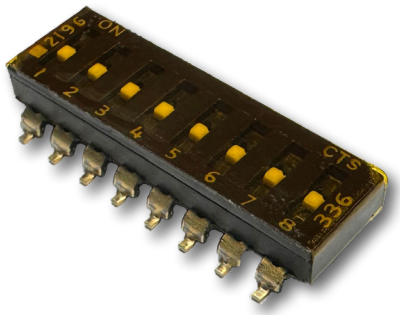
In particular, the delicate circuitry electronics in outdoor applications such as electric vehicles and home automation run the risk of having their performance reduced or ruined by elemental exposure unless preventative measures are taken as early as the assembly stage.

Outdoor operation will take its toll on electric systems, increasing the chance of corrosion and general malfunction.

Environmental impact on PCB control switches

Dual in-line package (DIP) switches are often used in conjunction with printed circuit boards (PCBs) that are found throughout all manners of electronics today. Allowing for manual changes to be made to electric circuits, DIP switches serve as inexpensive and easily integrable surface-mount solutions for an immense range of applications.

A typical DIP switch consists of a heat-resistant polymer casing with pins made of a flexible material like nylon, so they may withstand the mechanical forces they will be subjected to during operation. Underneath, the terminal and contact pins are located. The contact pins are usually made of tin- or gold-coated bronze to protect against corrosion, but more often than not, the terminal will not be coated. This makes it vulnerable to atmospheric corrosion brought about by exposure to changing temperatures, humidity and various pollutants - all of which are to be expected during exterior operation.



The series 219G DIP switch from CTS features gold-plated terminals to protect against atmospheric corrosion.

DIP switch solutions for harsh environment applications

To accommodate the industry need for environmental-resistant circuit control, CTS as developed the **series 219G DIP switch**, a surface-mount device with gold-plated terminals. This feature protects the switch from atmospheric corrosion, making it the ideal circuit control choice for applications operating outdoors and in harsh environments.

Series	Type	Mounting	Terminal Configuration	Circuit	Positions	Contacts
219G	Auto-Insertable/ Auto-Placable, Gold Terminals	Surface Mount	Gull-Wing, J Bend	SPST	2-10, 12	Gold

Ideal applications

Electric vehicle control units (EV-ECUs) and battery monitoring (BMS):
ECUs control and adjust electric vehicle driving dynamics based on information from the engine constituents. The performance of electric vehicles is completely contingent on reliable ECU operation, and as such, these systems stand to benefit greatly from the increased resistance to environmental influence that the series 219G DIP switch provides. With more resilient and durable circuit control, the end-user will see reduced costs for maintenance and repair, making electric vehicles a more affordable choice of transportation.

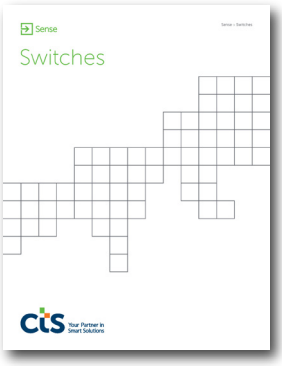
Exterior property automation:
Various semi-automated functionalities in both the private and public setting employ DIP switches to operate properly. For instance, the opening and closing of automated garage doors and gates are often control via DIP switches, and so are outdoor lighting. As these applications by definition will be exposed to the elements as they operate, the 219G DIP switch is a cost-effective choice that will help increase the reliability and life span of such technologies.

Industrial Control:
DIP switches are often preferred in industrial control settings, as they offer a simple and reliable way of configuring devices without the need for extensive software interfaces and programming. Applications include addressing and identification of different devices in an industrial network, configuration tasks in PLCs, input/output signal selection and many more. For such uses, the 219G offers reliable performances, even in the challenging environments of factory halls, where changing temperatures, fumes, varying humidity and dust are to be expected. Its resistance to such influences will help cut maintenance costs and downtime.

About CTS

CTS is a leading designer and manufacturer of products that Sense, Connect, and Move. We manufacture sensors, actuators, and electronic components in North America, Europe, and Asia, and provide solutions to OEMs in the aerospace & defense, medical, industrial, communications, information technology and transportation industries.

Explore Our Portfolio of Switches:



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