PenMount PCAP Value-Added Touch Solution

With the proliferation of touch screens, a variety of touch devices and applications can be seen in various fields such as industrial, medical, and vehicle. Many customers, while using standard projected capacitive (PCAP) touch controller products, are also looking for value-added features to meet the demands of their applications. These demands include the need to apply a certain level of force on PCAP touch for activation and the requirement for multiple GPIOs or external components. As a response, PenMount developed the PM1430 touch controller, which not only supports standard PCAP touch functionality but also offers various value-added features to enhance operational safety. In terms of hardware design, the PM1430 control board provides multiple sets of pins for connecting external components or simply as general-purpose input/output (GPIO). Paired with a custom software development kit (SDK), it offers the following three key features:

Enhanced Safety With Force Sensing Integration

The PM1430 controller can support two piezoelectric force sensors. When the change in piezoelectric sensing is minimal, the PM1430 controller filters the current touch coordinates through software to keep GUI elements underneath inactive. When a certain level of pressure is applied to the touch panel, resulting in a slight voltage change in the piezoelectric components that meets the software-defined threshold, the software processes the synchronized coordinate signals. This results in a pressure-confirmed touch safety mechanism, making the PCAP less false touch to environmental noise or inadvertent touches. Additionally, the PM1430 controller's firmware incorporates Class B Diagnostic Libraries for Functional Safety, effectively mitigating potential hazards during operation to comply with safety standards such as IEC 60335 and IEC 60730.

Highly Customizable Firmware Design

The PM1430 touch controller can be customized to meet various customer requirements. When sufficient pressure is applied, the firmware can control GPIO to notify external devices, such as emitting sound notifications if an external buzzer is connected, enhancing the user experience. Threshold values can also be adjusted through software, with higher thresholds reducing the probability of false touches. PenMount can also customize firmware functionality based on usage requirements, enabling dual-finger gestures only when enough pressure is applied.

Comprehensive Software Support

The PM1430 touch controller supports commonly used USB and I2C interfaces, both of which are compatible with the built-in HID drivers of Windows and Linux operating systems. Our software package includes example projects that integrate pressure-sensing functionality, serving as references for customers. For instance, the image below illustrates a car dashboard user interface featuring multiple customized buttons and scrollbar elements. Users need to apply slight pressure to activate these buttons, ensuring they are not inadvertently triggered while driving, thereby enhancing safety during use.

PenMount's design philosophy is to anticipate customer needs and understand their practical requirements. By providing a complete touch solution, our goal is to assist customers in seamlessly integrating projected capacitive touch products into their projects. We have also developed comprehensive tool programs to meet your common configuration needs, facilitating product development. Currently, we offer the TDS (Touchscreen Display Solution) Plus with a force sensing option. This module supports a maximum size of 15.6 inches, integrating a graphic overlay, front frame, PM1430 touch controller, piezoelectric sensors, and a touch panel. It is compatible with our existing PenMount Windows/Linux driver software.