[0122] As described above, the buttons **731-733** of sensing device **700** include differing surface areas. The sensing area of button **732** is greater than the surface area of button **733**. The sensing area of button **731** is greater than the surface area of button **732** and button **733**. In this embodiment, the pin **721** is coupled directly to button **732**. Alternatively, the pin **721** may be coupled to one of the other buttons or to conductive traces that may be used to electrically couple the buttons of the sensing device. Because the sensing area of button **732** is greater than the surface area of button **733**, the sensitivity of button **732** is greater than the sensitivity of button **733**. Similarly, because the sensing area of button **731** is greater than the surface area of button **732**, the sensitivity of button **731** is greater than the sensitivity of button **732**.

[0123] The sensing device **700** does not include a one-to-one ratio of pins to buttons, but rather a one-to-N ratio, wherein N is a number of 2 or more. Accordingly, this sensing device does not require additional pins to implement additional button operations. For example, using the one-to-N configuration in a keyboard design may require less than **101** pins to implement the **101** keyboard buttons that are present in a full keyboard.

[0124] As illustrated with respect to FIG. **7**A, the sensing device may include three buttons coupled to one pin. Alternatively, the sensing device may include two or more buttons coupled to one pin, as illustrated in FIG. **8**A.

[0125] FIG. **8**A illustrates one embodiment of a sensing device **800** having two touch-sensor buttons **831** and **832** coupled to one pin **821**. Sensing device **800** is similar to the sensing device **700**, except that it only has two sensor elements for the two buttons **831** and **832**. The sensor elements are electrically coupled together, and are coupled to a single pin of the processing device **210**, pin **821**. By determining the capacitance on pin **821**, two button operations may be distinguished based on the sensitivities of the two buttons **831** and **832**. Since the surface area of button **831** is greater than the surface area of button **832**, the sensitivity of button **831** is greater than the sensitivity of button **832**. In one embodiment, the sensitivity of the button **831** may be set a first sensitivity threshold and the button **832** at a second sensitivity threshold that is less than the first sensitivity threshold. The second sensitivity threshold may be the presence threshold **645**, or alternatively, a threshold above the presence threshold **645**, but below the first sensitivity threshold. If the capacitance variation that is measured on the pin **821** is greater than the first threshold, the processing device **210** determines that button **831** has been activated (e.g., presence of the conductive object has been detected on the button **831**). However, if the capacitance variation measured on pin **821** is less than the first threshold, but greater than the second threshold (e.g., presence threshold **645**), the processing device **210** determines that button **832** has been activated (e.g., presence of the conductive object has been detected on the button **832**).

[0126] FIG. **8**B illustrates one embodiment of a sensing device **850** having four touch-sensor buttons **833-836** coupled to one pin **822**. Sensing device **850** is similar to the sensing device **800**, except that it has four sensor elements for the four buttons **833-836**, rather than only two. The sensor elements are electrically coupled together, and are coupled to a single pin of the processing device **210**, pin **822**. By determining the capacitance on pin **822**, four button operations may be distinguished based on the sensitivities of the four buttons **833-836**. The surface area of button **833** being the largest and the surface area of button **836** being the smallest, the surface area of the buttons decrease in size from button **833** to button **836**. Similarly, the sensitivity of the buttons decrease from button **833** to button **836**. In one embodiment, the sensitivities of the buttons **833-836** may be set at a first sensitivity threshold for button **833**, a second sensitivity threshold of button **834**, a third sensitivity threshold for button **835**, and a fourth sensitivity threshold of button **836**. The sensitivity thresholds decrease in value from the first sensitivity threshold to the fourth sensitivity threshold. The fourth sensitivity threshold may be the presence threshold **645**, or alternatively, a threshold above the presence threshold **645**, but below the third sensitivity threshold. If the capacitance variation that is measured on the pin **822** by the processing device **210** is greater than the first threshold, the button **833** has been activated; greater than the second threshold, but less than the first threshold, the button **834** has been activated; greater than the third threshold, but less than the second threshold, the button **835** has been activated; and greater than the fourth threshold, but less than the third threshold, the button **836** has been activated.

[0127] FIG. **9**A illustrates one embodiment of a sensing device **900** having three keyboard keys **951-953** and three sensor elements **931-933**. Sensing device **900** includes four layers, routing layer **901**, insulation layer **902**, pad layer **903**, and plastic film layer **904**. The routing layer **901** includes three sensor elements **931-933** that are electrically coupled together. The three sensor elements **931-933** are coupled to a single pin of the processing device **210**. The routing layer **901** may be the sensing side of the PCB, described herein. Insulation layer **902** may be an insulating cover, a flexible membrane, or a transparent overlay. The insulation layer **902** may be a dielectric material The insulation layer **902** may be non-conductive material used to protect the circuitry to environmental elements and to insulate the button areas of conductive material of pad layer **903** (e.g., conductive object) from the circuitry. In one embodiment, an adhesive layer may be deposited between the routing layer **901** and the insulation layer **902**. The button areas **961-963** may be similar or dissimilar material to the rest of the material of the insulation layer, for example, the button areas **961-963** may be dielectric material.

[0128] Coupled to the insulation layer **902** is the pad layer **903**. Pad layer **903** includes three button areas **941-943**. The button areas **941-943** may include conductive material, such as copper. The material surrounding the button areas **941-943** may be non-conductive material. The button areas **941-943** of the pad layer **903** operate as the conductive object that is detected by the sensing device (e.g., routing layer **901**), as described herein. The conductive material of the button areas **941-943** can be detected by the sensor elements **931-933**, respectively, when the button areas **941-943** approach the routing layer **901** when the keyboard keys **951-953** have been pressed. For example, when force is applied to keyboard key **951**, the keyboard key **951** presses against the portion of the pad layer **903** that includes button area **941**. When force that is applied against the portion of the pad layer **903** that includes button area **941**, the button area **941** approaches, or gets closer to, the sensor element **931** of routing layer **901**. As the button area **941** is approaches the sensor element **931**, the capacitance on the sensor element **931** increases. The capacitance variation can be measured on the sensor element **931** to determine that the keyboard key **951** has been pressed, as described below.