TSSEVB Demo Application Guide

RTAC Americas

1. Introduction

The TSSEVB contains an MCS08LG32 MCU programmed with demonstration software that will help users evaluate the Touch Sensing Suite for their end applications. This application software comes with four demonstration applications to show the versatility the Touch Sensing Suite gives users.
The evaluation board (EVB) demo application can be tested as stand alone, or use the JM60 Communications board to view the graphs of all the electrodes using the Electrode Graphing Tool.

2. Initial Demo

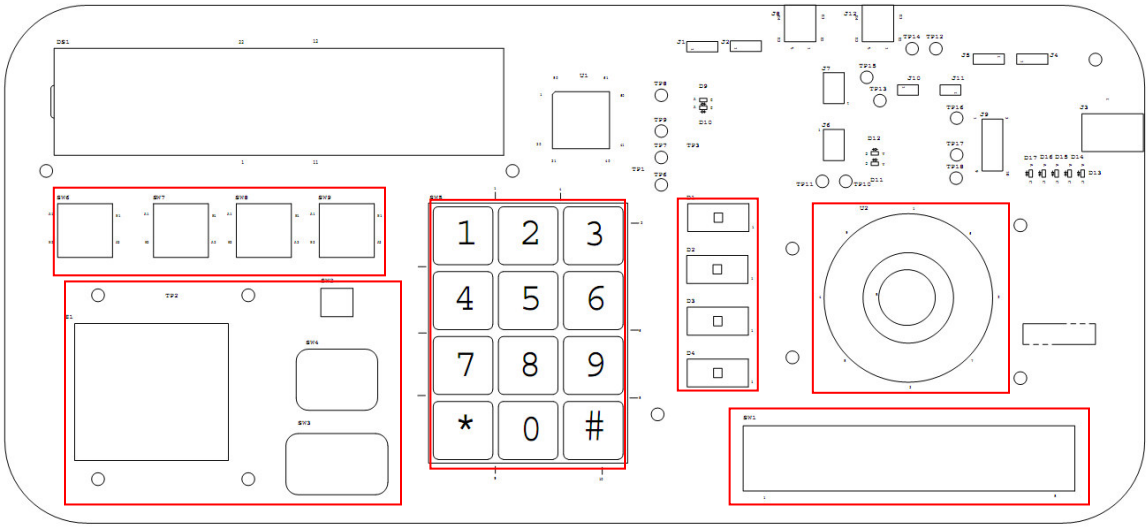

Figure 2. Available electrodes in the shadow demo

After turning on, the TSSEVB begins with the first demo available, “Shadow Demo”. This demo begins by displaying on the LCD screen a “0123” in the alphanumerical section. After touching any button on the EVB, the corresponding LCD segment turns on, indicating that a button is touched. After releasing the button, the LCD segment turns off, indicating that the button has been released. The use of the slider on the bottom right of the board turns on or off the slider LCDs. This depends if the user is turning up the slider–sliding to the right, or turning down the slider–sliding to the left.

The rotary control can also be used to increment or decrement the number shown on the LCD screen. The rate of change for the number depends on the speed that the dial is rotated. The board also has four electrodes that have an LED that toggles each time the electrode is touched.

3. Navigating between Demos

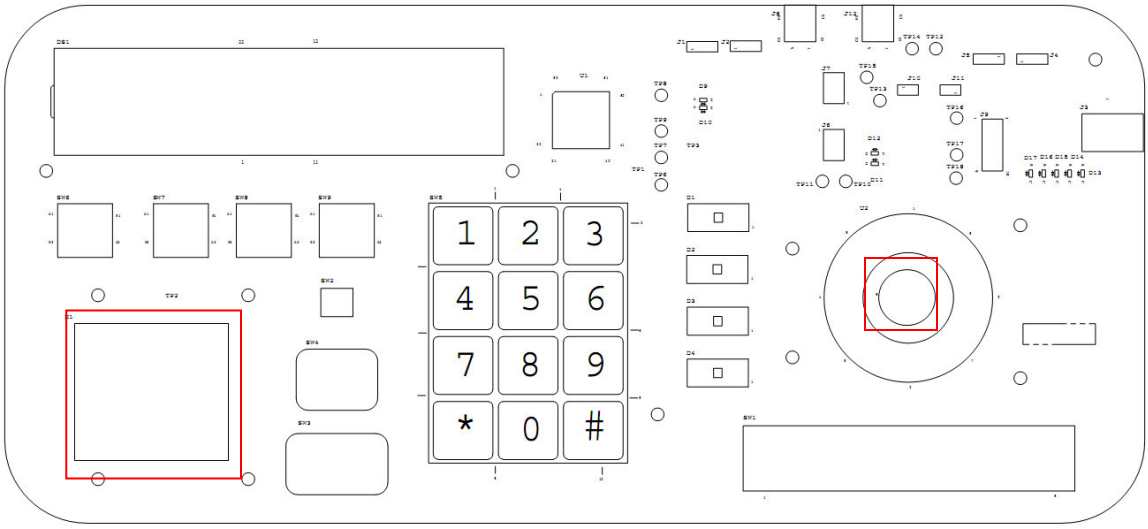

Figure 3. Buttons used to navigate between demos

The application software has the ability to demonstrate other applications. To do this, touch the large electrode on the bottom left of the board simultaneously with the electrode in the middle of the rotary control for about 3 seconds. See figure 3. The LCD screen then shows the demo being run on the number pad, and the name of the demo on the alphanumeric segments. The user can then release the circular button and press again to switch between demos. It is necessary to keep the large lower left button pressed while switching between demos. To select the demo release the large button.

4. Alarm Clock Demo

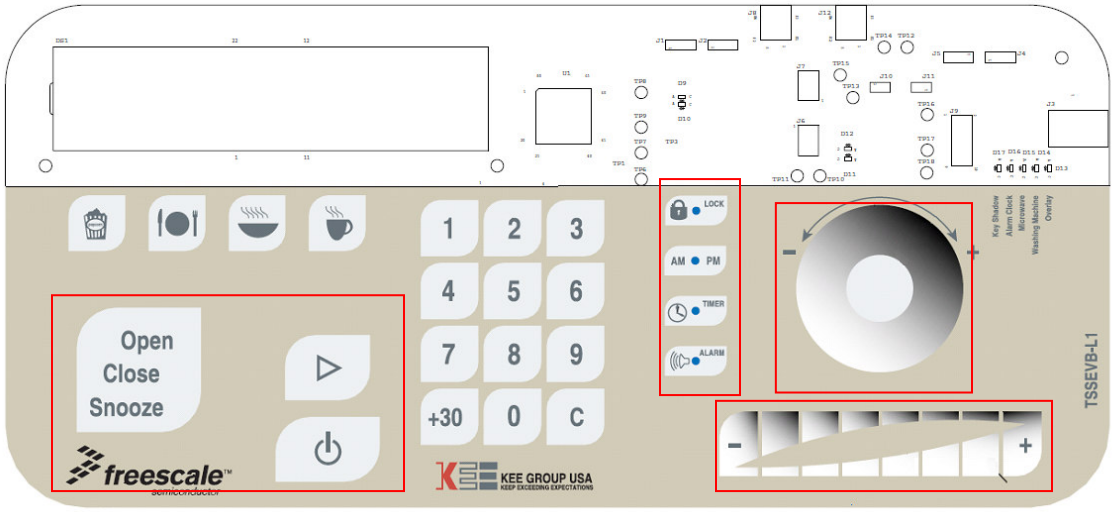

Figure 4. Available buttons in the alarm clock demo

The second demo available for the TSSEVB is the “Alarm Clock” demo. This demo begins with showing a clock. In this demo, the slider acts as a volume control for when the alarm is active. To turn off the clock, touch the power button, this turns off all the electrodes for the clock and any LED and LCD segments. The alarm clock can be turned back on by touching only the power electrode again. While the system is on, the electrodes with LEDs have special functions associated each of them. The top button acts as a key lock. Touching the key lock turns on the LED in the electrode, indicating that the system is locked and disabling all other keys on the system. Touching the electrode again unlocks the system and turns off the LED indicating the system is unlocked.
The electrode directly under the key lock electrode is the AM/PM switch. When the system is in edit mode, this button is used to change the AM/PM settings to either the clock or the alarm setting. The next button is the edit button. Whenever the edit button is touched, the user has the ability to change the settings of the clock currently displayed. If the clock is displayed and the edit button is touched, the clock time may be modified through the rotary dial as well as with the AM/PM button. To click on the alarm button, which is under the edit button, turns the alarm on or off. To view the alarm time setting, touch the alarm button, but not in edit mode. After the alarm time appears, touching the edit button allows the user to edit the alarm time through the rotary dial and with the AM/PM button. After the desired time is selected, exit edit mode by touching the edit button again.

5. Microwave Demo

The third demo available on the TSSEVB is the “Microwave” demo. This demo intends to emulate the control of a Microwave. To access this demo follow the instructions in the “Navigating between Demos” section. When accessing the “Microwave” demo, the LCD displays “0000” in the alphanumeric section and stays in this mode for a few seconds. If no button is touched, the application displays the clock information. To exit the clock mode, touch any of the active buttons of the demo. The “Microwave” demo uses the buttons marked in red in figure 5.

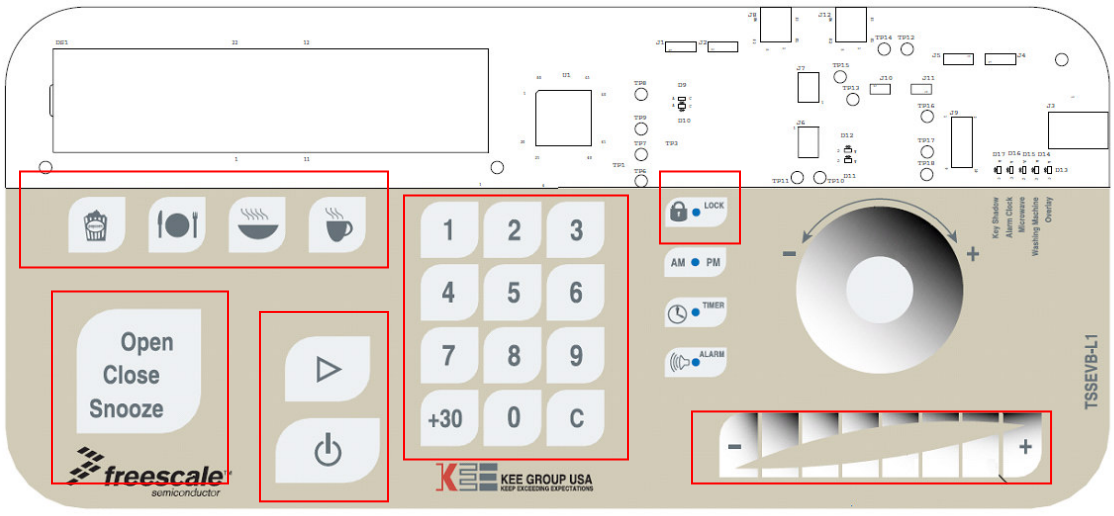

Figure 5. Active buttons in the microwave demo

In the upper left side of the board there are Quick Access Buttons. Touching any of these buttons sets a preconfigured time and power value into the LCD.

The power is controlled through the slider buttons located in the lower right section of the board. When touching the slider, moving from left to right increases the power, moving from right to left decreases the power. The power is represented by the vertical segments on the LCD (shown in figure 6).

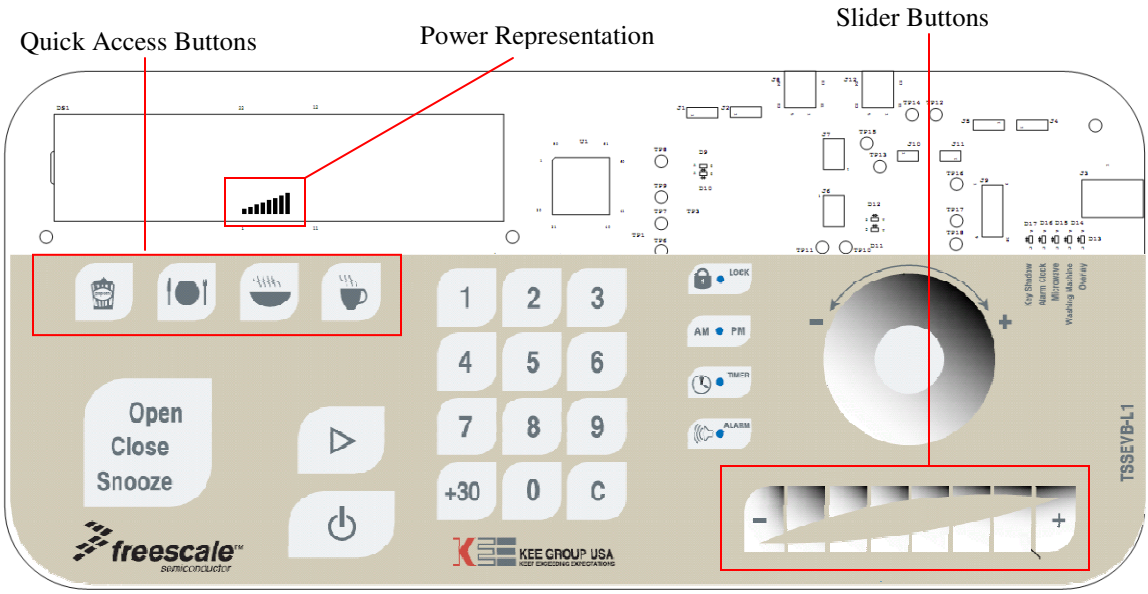

Figure 6. Microwave demo quick access and power buttons

The “Microwave” demo uses the keyboard to set the time. The time selected is displayed on the LCD. Each time you touch a key from the keyboard, the respective number appears in the less significant character of the LCD and moves the current characters one position to the left, eliminating the most significant character. The key with the pound character or “C” (depending on if you are using the overlay or not) represents the clear button. Touching this key resets the time value in the LCD to zero. In case the demo has already started counting, touching the clear key stops the count and clears the time displayed on the LCD. The asterisk character or “+30” adds 30 seconds to the current time value. Figure 7 shows the keyboard buttons.

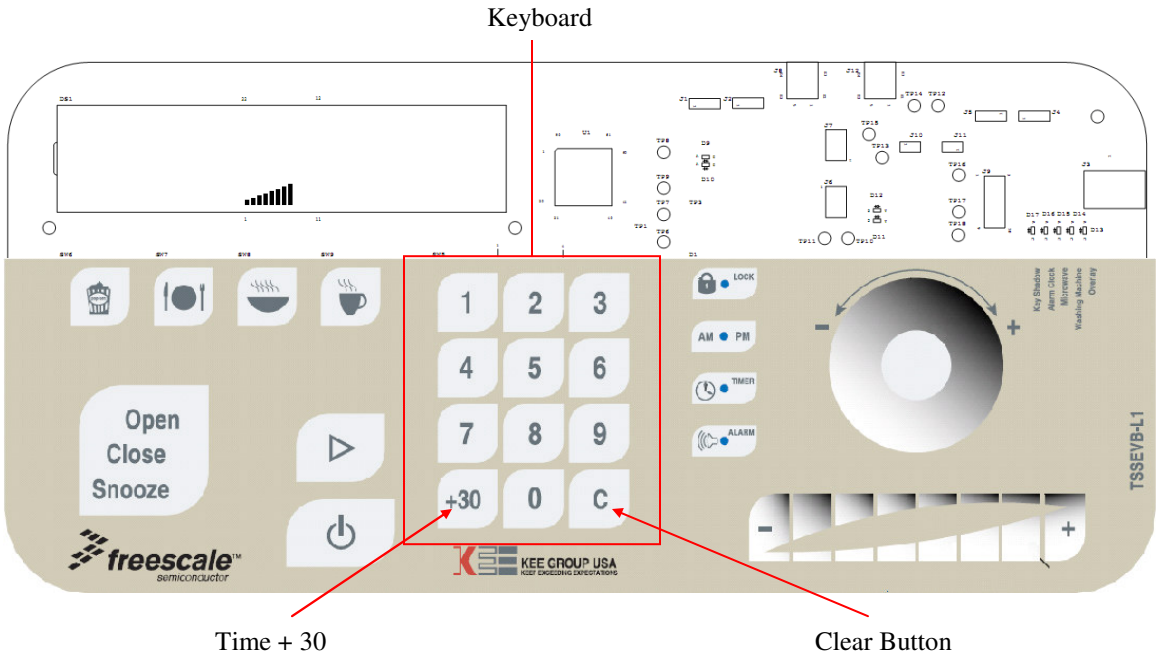

Figure 7. Microwave demo keyboard functions

After the time is set, you can start decrementing the time by touching the Start/Pause button located on the left side of the keyboard, touching the Start/Pause button again stops the count. To resume the count simply touch again the Start/Pause button.

The demo features an On/Off button. The On/Off button is located on the lower left side of the board. Figure 8 shows where the On/Off button is located the board. Touch the On/Off button to turn off the demo, the application will then display an “OFF” message in the LCD. To turn on the demo simply touch the On/Off button again. When the application turns back on from the off mode, the information regarding the time and power is cleared.

The Open/Close button is located on the lower left section of the board (refer to figure 8). When the Open/Close button is touched, the application enters the open mode. In this mode the "Open" message is displayed in the LCD and if the demo was counting, the demo is interrupted. To exit the open mode, touch the Open/Close button again. The open mode will not clear the information regarding the time and power.

The lock button disables most of the buttons, except for the Open/Close and On/Off buttons. When the lock button is touched the LED attached to the button turns on indicating that the Lock button is active. To re-enable the buttons, touch the Lock button again, the LED turns off indicating that the lock button has been deactivated and the buttons are re-enabled. Figure 8 shows where the buttons are located.

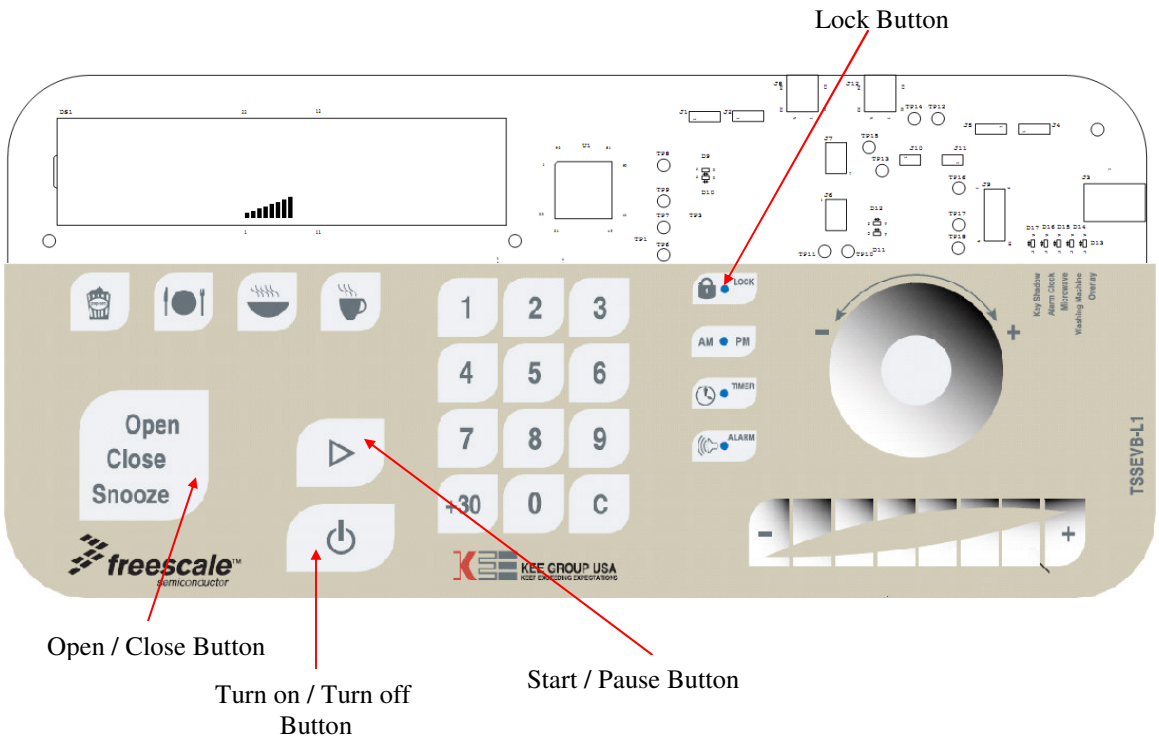

Figure 8. Microwave demo functions

6. Washing Machine Demo

The fourth available demo on the TSSEVB is the "Washing Machine" demo. This demo emulates the control of a washing machine. The demo begins by displaying “0000” in the alphanumeric characters of the LCD.

The Load Size buttons are located on the top left side of the board. These buttons control the water level. There are four options to choose from: Small, Medium, Large, and Super Plus. Only one option can be selected at a time. After touching one of the Load Size buttons, the corresponding LCD segment turns on and turns off the previous load option. When the demo starts, the Small load option is selected by default.

The Wash Cycle buttons set pre-defined values of time. There are four different washing cycle options available in this demo, these are; Normal, Casual, Hand Wash and Extra Care. You can choose either one by touching the corresponding value. Only one option can be selected at the same time, choosing one unselects the others.

You can also set the time using the keyboard buttons. To set a specific time, touch the Timer button. The LED attached to the Timer button turns on and you can set the time using the keyboard buttons. To exit this mode touch the Timer button again, the LED turns off and the time selected is displayed on the LCD.

The Start button makes the application start decrementing the time value. You can set the time by using the wash cycle buttons or the keyboard buttons (explained above). After setting the time, touch the Start button and the application then starts counting. The Start button is located in the center of the rotary control in the upper right side of the board.

Using the Temperature buttons controls the water temperature. There are three different temperatures to choose from: Cold, Warm, and Hot. The demo allows you to choose two different temperatures at a time. When the demo is first accessed the Cold temperature is selected by default.

When the Light On/Off button is touched, the application turns on all the LEDs located at the upper right side of the board. Touch the Light On/Off button again to turn off the LEDs.

The On/Off button is located on the lower left side of the board. Touch the On/Off button to turn off the demo, the application will display the "OFF" message in the LCD. To turn on the demo simply touch the On/Off button again. When the application turns back on from the off mode, the information regarding the time, temperature, load size, and wash cycle return to the default values.

The lock button disables most of the buttons, except for the Open/Close and On/Off buttons. When the lock button is touched, the LED attached to the button turns on indicating that the Lock button is active. Touch the Lock button again to re-enable the buttons, the LED then turns off indicating the lock button has been deactivated and the buttons are re-enabled.

The extra rinse and the energy saving buttons toggle the attached LED to the respective button every time they are touched. Figure 9 shows the washing machine overlay and where the buttons are located.

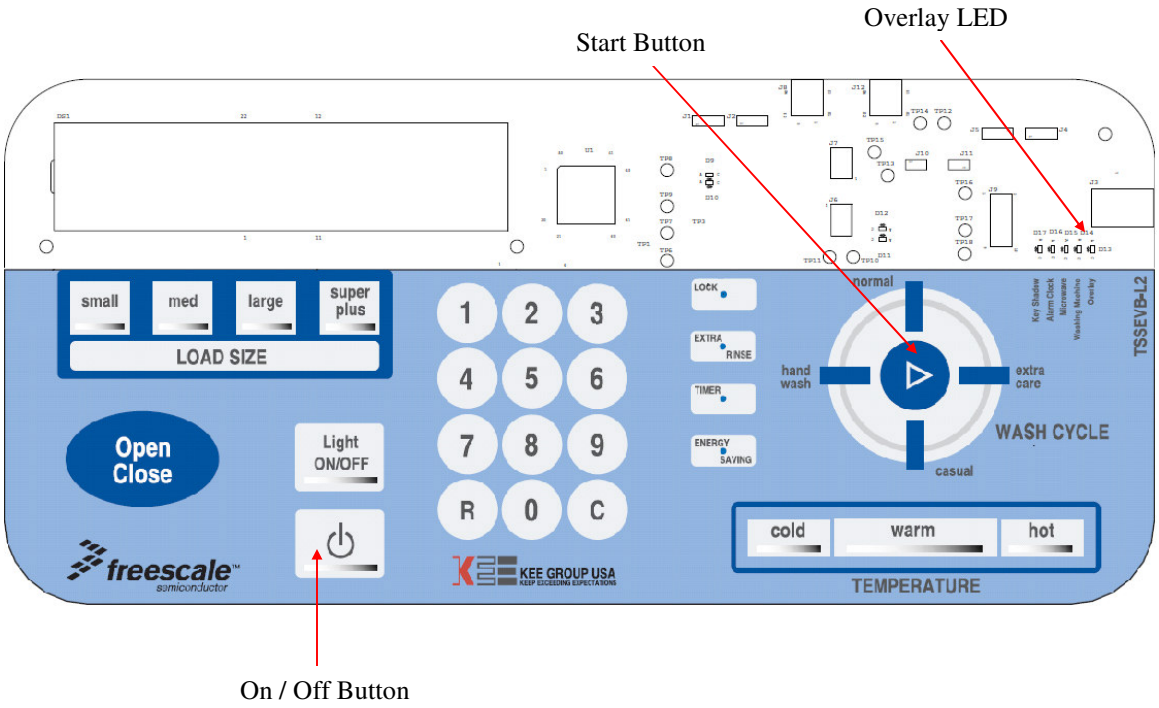

Figure 9. Washing machine demo functions

The “Washing Machine” demo can be used along with the Washing Machine overlay included in the TSSEVB board. The Washing Machine overlay has a thickness of 1.78 millimeters, therefore the TSS software must use a more sensitive configuration to work properly. When the application is using a more sensitive configuration the LED marked as Overlay turns on. The Overlay LED is located on the upper right side of the board (see figure 9). The washing machine overlay may not work properly on the other demos, because of the sensitivity configuration.

NOTE

To ensure the proper recalibration of electrodes, you must reset the application every time you change the overlay of the TSSEVB.